THE FORMS OF NASAL OBSTRUCTION



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NASAL OBSTRUCTION

1887

Dr Norman Dalton
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THE FORMS OF NASAL OBSTRUCTION

THREE LECTURES

ON

THE FORMS OF NASAL OBSTRUCTION

IN RELATION TO THROAT AND EAR DISEASE

DELIVERED AT THE THROAT HOSPITAL, GOLDEN SQUARE, W.

BY

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NOTICE

THE Author wishes it to be distinctly understood that the Three Lectures herein comprised do not in any way constitute a text-book. His main object has been to introduce certain points in the pathology and therapeutics of nasal disease, as taught and practised by himself at the Throat Hospital. And these points, he trusts, will prove of value to the student and general practitioner.

47, Queen Anne Street, W.
June, 1887.

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THE FORMS OF NASAL OBSTRUCTION

Lecture I.

GENTLEMEN,—In these days of multiplication of text-books, the lecturer finds it unprofitable to himself, and wasted time to his hearers, if he treat of the subjects systematically arranged therein. I do not, therefore, propose to take you over the whole field indicated by the title I have chosen for these three Lectures, seeing that you can traverse it for yourselves better than I could lead you. Indeed, I intend discussing only the commonest forms of nasal obstruction, and solely as they appear to myself. But, nevertheless, although I say the diseases of which I shall treat are of common enough occurrence, yet some at least of them have been but inadequately described, while their pathology is often totally misunderstood. And it is my hope that I shall, if not elucidate these myself, at any rate help you to investigate them for yourselves.

Briefly, the affections to which I wish to draw your attention are these:

Classification of diseases under discussion

I. Obstructions the obvious consequence of chronic rhinitis; which may be further divided into—

(*a*) Chronic catarrhal rhinitis with vascular tumefaction;

(*b*) Chronic catarrhal rhinitis with hyperplasia; this leading in its turn to—

(i) Dry hyperplastic rhinitis;

(ii) Dry atrophic rhinitis.

II. Obstructions arising from mucous polypi and cysts.

III. Obstructions arising from post-nasal neoplasms.

These divisions are purely artificial, seeing that no line of demarcation can be drawn between them. Nevertheless, as you will see, they are rational, and will be of assistance pathologically as well as therapeutically.

The consideration of these various forms of obstruction will involve the investigation of symptoms referred to more remote structures than the nasal mucous membrane; and we shall inevitably find ourselves discussing diseases which at present you may suppose to be apart from the domain of nasal pathology—and this, although I do not consider it necessary to do more than refer in the briefest manner to the various so-called nasal neuroses.

Before I describe seriatim the diseases I have mentioned, I propose enumerating the various symptoms, subjective and objective, of nasal obstruction, from whatever cause arising. And before these can be satisfactorily discussed, I must give you an idea of the normal appearances of the nasal fossæ, as revealed by anterior and posterior rhinoscopy.

Description of normal appearances necessary

This I must trouble you with, seeing that some otherwise trustworthy text-books give but imperfect, and sometimes actually erroneous, descriptions of the normal appearances; and believing as I do that no class of speculum-observation needs so much practice and patience before it can be employed with satisfaction to ourselves and benefit to our patients.

The apparatus needed for anterior rhinoscopy is simple enough. A good light from a laryngeal reflector, a nasal

speculum, and one or two probes, are all that is needed. The form of speculum is not of much consequence, provided the blades are not fenestrated; otherwise small hairs in the vestibule obstruct the view. Thudichum's instrument in two or three sizes serves all purposes, and is self-retaining.

Fenestrated speculum objectionable

Well, then, having dilated the nostril and illuminated the interior, what do we see? Presuming the head to be sufficiently tilted back to afford the best view, and the projecting hairs held on one side by the blades of the speculum, we see for a greater or less distance into the nasal fossa. In the lower part we observe standing out from the external wall the inferior turbinate body, a fold of mucous membrane covering the inferior spongy bone, and including a plexiform arrangement of veins to which the erectile property of the structure is due. This erectile tissue extends along the free border of the turbinate body, being specially developed at the anterior and posterior extremities. According to the degree of turgidity we can see to a greater or less distance along the inferior meatus; but frequently the swelling is so great, although scarcely to be considered pathological, that this channel is completely blocked. After exposure to cold air, and during an attack of acute coryza, the inferior turbinate body becomes greatly swollen and darker in colour than the usually bright red of its mucous membrane, a point to which I shall have to refer again in speaking of the functions of the nose in relation to pathology. Yet although I say this turgidity is scarcely to be considered pathological, at any rate anatomically it frequently comes under observation as a form of nasal obstruction, and as such requires definite treatment.

Erectile tissue of inferior turbinate body;

its tumefaction physiological

If we investigate with a probe the nature of the inferior turbinate body when in a state of turgidity, we observe

that with this instrument it gives the sensation of a bag loosely filled with fluid. Indeed it fluctuates; and on a first examination one can hardly be persuaded that it does not contain fluid other than the blood of its erectile structure. But the application of a twenty per cent. solution of cocaine quickly restores it to its normal condition, and the true nature of the swollen tissue is revealed.

Cocaine reduces vascular tumefaction.

Besides that on the inferior spongy bone, there is another mass of erectile tissue on the septum, a little lower than opposite the anterior third of the middle turbinated bone. This is as liable as the inferior turbinate body to erection, although its smaller bulk renders it less conspicuous. But the appreciation of its real character is quite as important, seeing that not infrequently its turgidity leads to the supposition that the middle turbinate body is in contact with the septum, whereas the erectile tissue merely conceals the slit which normally exists between the convex margin of the middle turbinate and the inner wall. The middle spongy bone has also a small amount of erectile tissue along its free margin.*

Erectile tissue also on the septum

and middle spongy bone

And now we must consider more particularly this middle turbinated bone and its coverings, which are so much misunderstood in their physiology and pathology, not to speak of their normal appearances; and the diseases of which are so numerous, and have given rise to so much dispute, that I trust you will pardon me if I seem to trespass unduly on your time with minutiæ on this head.

Importance of latter

According to the degree of prominence in the inferior turbinate body, we see more or less of the free convex border of the middle spongy bone, between which and the septum there is a clear passage, although this may be obscured by the erectile tissue on the septum which I have

* Bigelow, *Boston Medical and Surgical Journal*, April, 1885.

mentioned. This, I say, is important to bear in mind, seeing that in certain inflammatory conditions the middle turbinated tissue is found in contact with the septum, and the physiological may be mistaken for the pathological, or *vice versâ*. Then, between the free margin of the bone, curved inwards on itself, and the outer wall of the fossa, is a deep sulcus, corresponding with the concavity of the spongy bone, so that the free margin appears to hang downwards from the roof. Once more we must observe and remember that between the anterior extremity of the middle spongy bones and the nasal bones there is a free passage, which, nevertheless, is considerably narrower in the living subject than in the skeleton. This passage also in pathological conditions is occasionally obstructed.

The inferior and middle meatus

That portion of the fossa which lies below the upper margin of inferior spongy bone is commonly spoken of as the inferior meatus; into it opens the naso-lacrymal canal. Between the concavity of the middle turbinated bone and the convexity of the inferior extends the middle meatus, into which, an inch and a half or two inches from the orifice of the nose, opens the antrum, as well as higher and more anteriorly the frontal sinus with the anterior ethmoidal cells, through the semilunar opening into the infundibulum.

Deflection of septum and bony ridges

In by far the majority of individuals we find more or less deflection of the septum, with the greater or less development of bony ridges running from before backwards. The most frequent site of the deviation is at the junction of the vomer with the perpendicular plate of the ethmoid and the triangular septum. This malformation, which it must be considered although the rule rather than the exception, chiefly interests us at this stage of examination because of the difficulty it causes in examining properly the side encroached upon. Deviation of the septum may be readily

diagnosed from ecchondrosis of the septum by the corresponding depression in the opposite fossa.

So much for what is seen by anterior rhinoscopy.

Posterior rhinoscopy:

Posterior rhinoscopy is at once more difficult and easier than anterior. As you well know, it is effected by manipulation of the laryngeal mirror directed upwards behind the soft palate. The difficulty consists in placing the mirror in position; but that effected, the structures brought into view are easy enough of comprehension.

Apparatus

In ordinary cases all that is needed is a small laryngeal mirror, with stem strong enough for the angle to serve as a tongue-depressor. For examining the septum, turbinated bodies, and vault, the angle of the mirror should be about a right angle, while for investigating the posterior naso-pharyngeal wall, the angle should be even wider than that of the laryngeal mirror. Sometimes it may be necessary to use a tongue-depressor as well. In either case we must insinuate the mirror behind the uvula without touching either it or the posterior wall of the pharynx. The advantage of dispensing with the tongue-depressor is that, with our left hand, we can steady the patient by holding his chin. But in every case we must persuade him that we are master of the situation. A patient knows who is examining him as well as a horse knows its rider, and he permits us to get a view or not, according to our manipulative dexterity. We must be at once firm and gentle for this sometimes exceedingly difficult operation. Often we may cause relaxation of the soft palate by requesting the patient to breathe through his nose; more often, however, he only closes his mouth. But the longer we take to get a view, the more difficult does it become. Sometimes we may need the application of a ten per cent. solution of cocaine, in conditions of great irritability; and sometimes we may be

helped by one of the many forms of palate-hook, in conjunction with cocaine. Of course we should aim in this, as in all surgical manipulations, at effecting our end with the simplest means and least display of apparatus.

Well then, having the angle of the mirror pressing on the back of the tongue, and the upper edge of the reflecting surface just below and well behind the margin of the pendulous palate, we have our view of the post-nasal structures, a view, however, pieced together by a series of altered inclinations of the mirror. We see the two choanæ separated by the vertical, in this situation very rarely deflected, septum. Into these project almost horizontally the three, sometimes four, turbinated bodies with their intervening channels. The inferior meatus, owing to the prominence of what is called the uvula-cushion, frequently appears as no more than a narrow slit, while often the whole of the inferior turbinated body is hidden. The middle meatus is not infrequently contracted by congestion of the erectile tissue covering the bone below, while the superior meatus may appear to possess an unwarranted importance, seeing that it is only posteriorly that it is fully developed.

Structures exposed:

Choanæ

Externally to the choanæ we see the yellowish opening of the Eustachian tube, with the salpingo-palatine fold in front and the salpingo-pharyngeal fold behind. Externally to this again is Rosenmüller's fossa, into which the Eustachian catheter sometimes inadvertently passes. In the anterior part of the vault we may, or may not, distinguish the raised collection of lymphoid tissue described as Luschka's tonsil, in the centre of which a depression may sometimes be seen. Running downwards from this are not infrequently seen two adjacent folds of mucous membrane, one on each side of the central raphe. These and Luschka's tonsil otherwise called the pharyngeal bursa, have lately given

Eustachian tube

Luschka's tonsil

rise to much speculation and divergence of opinion, of no practical and not much other value.*

Colour of mucous membrane

Now I have only a word to say concerning the normal colour of the nasal and naso-pharyngeal mucous membrane —a matter not very easy to determine in a city like this, where nearly every one suffers from more or less nasal catarrh. In front the darkest portion is the inferior turbinated body, the middle being much paler. Posteriorly the structures projecting into the choanæ are usually a pale grey in colour, while the mucous-membrane of the naso-pharynx in general may be described as pinkish grey.

Symptoms:

And now before considering the various affections which give rise to nasal obstruction, I will recount to you some of the more obvious symptoms, principally subjective, for which the patient seeks relief; and I shall refer to certain points in the physiology of nasal respiration explanatory of one or two objective signs which nevertheless are not dependent for their discovery upon instrumental examination.

Complaints of obstruction frequently absent

As one would naturally suppose, the patient frequently complains of his nose being stopped up; yet he frequently denies any obstruction to his breathing, although he may actually be suffering from very grave interference with that function. In the former case the obstruction is more or less complete, while in the latter it is only partial. When complete obstruction exists, the sufferer complains of difficulty in breathing; this he experiences especially on taking any extra exertion and during sleep, when he not only snores, from the air impinging through the mouth on the lax velum and causing it to vibrate, but he may tell you he often wakes up struggling for his breath. Sometimes,

asthma

indeed, the patient is supposed to be asthmatic, as

* *Journal of Laryngology*, February, 1887. Art. "The Pharyngeal Bursa."

indeed he may be though the cause is nasal obstruction. Then he may complain of dizziness, loss of memory, inaptitude for mental exertion, symptoms to be referred more properly to the anæmia resulting from interference with respiration than from direct or reflex irritation as some imaginative observers maintain. Occasionally the sufferer will assert that there is something flapping in his throat or nose, and the noise may even be audible to a bystander, a phenomenon which obtains when a pedunculated polypus or flap of hypertrophied mucous membrane is the cause of obstruction. Another symptom observable to the patient's friends, and for which he is peculiarly hated by his enemies, is a perpetual sniffling varied by frequent and unsatisfactory attempts at blowing his nose. The nasal flux may be so excessive that the patient's pillow is stained with it: he may have frequent attacks of sneezing, specially aggravated the first thing in the morning. Then his speech is thick and guttural from a semi-paretic condition of the palate—his voice is nasal, in common parlance—and he experiences difficulty in chewing and swallowing. In the case of polypi the symptoms are all more or less aggravated during damp weather. A patient of mine lately came one morning drenched by a passing shower. He inconsiderately attributed the blame to me, saying I had utterly ruined his aneroid on which he had learned to be so dependent, in that I had removed some enormous nasal polypi! But since he had been told two or three months previously by a physician of repute that he had incipent softening of the brain, his symptoms being headache, anxiety, impaired memory, difficulty in speech, and general feebleness; and since all of these had been greatly relieved by restoring nasal respiration, his complaints were in the nature of gratitude rather than of aught else!

anæmia

aggravation when barometer falls

Taste and smell

The sense of smell is of course interfered with, and this although taste may be almost or quite normal. The reason of this is obvious when we consider the course of the inspired and the expired air-currents. Even in the healthy condition, probably very little of the inspired air reaches so far back as the bulk of the superior turbinated bone, while when the upper channels of the nose are obstructed none can pass in that direction. But on the contrary, the expired air, which during mastication is laden with odoriferous particles, is driven by the thorax directly upwards to the vault of the naso-pharynx and readily comes in contact with the projecting superior turbinated bone, over which is distributed the posterior division of the olfactory nerve. Indeed it would not be incorrect to style the superior spongy bone the organ of taste, the middle turbinated and plain surface of the ethmoid that of smell. Of course, we may have polypi obstructing access to the superior spongy bone; but it is not common, obstructions for the most part being confined to the region of the middle and inferior turbinated bone.

The superior spongy bone may be considered the seat of taste.

Pigeon-breast

Among the far-reaching consequences of nasal obstruction we must mention the occurrence of pigeon-breast, which in its relation to enlarged tonsils was first pointed out by Dupuytren. Indeed, when we meet such grave disturbances as this simply as the consequence of nasal obstruction, we cannot fail to be impressed with the importance of the nasal functions, although it is difficult to perceive from mechanical considerations why respiration should not be even easier through the mouth. Probably enough, contraction of the bronchial tubes is a physiological regulating valve for the prevention of improperly prepared air gaining access to the pulmonary vesicles, and for enforcing nasal respiration. Indeed we never see asthmatics

with open mouth, but with dilated nostrils. Breathing, they will tell you, is so much easier through the nose. I had a patient lately in the hospital suffering from laryngeal stenosis. He could breathe fairly comfortably when his nasal passages were free ; but when from any cause they became obstructed he was seized with stridor. He could even produce the stridor at will by holding his nose and adopting buccal respiration. The case suggests very strongly the importance of a healthy nose for the mechanical welfare of the larynx.

illustrative case

Then, again, we must accept as fact the not infrequent cure of spasmodic asthma by the removal of nasal polypi. One reads of even more serious diseases, such as epilepsy, being caused by such interference with respiration ; and I imagine they can all be explained on the mechanical theory, without having recourse to the elaborate and conflicting observations and opinions of our Continental *confrères*. But I do not in this place intend referring to the so-called nasal neuroses, seeing that they have not fallen under my observation.

The so-called nasal neuroses

Continuing the enumeration of possible consequences of nasal obstruction, we must not forget epiphora or lacrymal abscess as the result of pressure on the nasal duct.

epiphora or lacrymal abscess

Whether Eustachian deafness can be considered as a direct consequence of nasal stenosis, or rather as an extension of a catarrhal process, may be open to discussion. Some authorities hold that the tube is permanently open, and that fresh air enters the tympanum by diffusion at every inspiration. This is too large a physiological question to discuss at present, and I will be content with mentioning two practical points : first, that there is no manner of doubt that post-nasal growths cause direct occlusion of the Eustachian tube ; and second, that whatever the physio-

Eustachian deafness

logical facts, restoration of the nasal functions frequently leads the way to the permanent cure of Eustachian and middle-ear catarrh.

I have now mentioned the principal subjective and functional symptoms arising from any form of nasal obstruction. But with those objective symptoms of which I intend speaking now, I must be more precise as to the exact seat of the obstructions which give rise to them.

And first I will inform you of certain appearances to which sufficient attention has not hitherto been paid, and which are due to obstructions arising in connection with the middle turbinated bone. The first is a physiognomical and the second a pharyngeal sign, often, though not necessarily, associated with one another.

physiognomy peculiar to obstruction in the middle meatus

Whenever the middle and upper channels of the nose have been obstructed for some time (I cannot speak more definitely), whether from the presence of polypi, or from hyperplasia of the mucous membrane covering the middle spongy bones, in which state the whole of the middle meatus may be blocked up and the passage into the superior channel obstructed, we find a peculiar expression of the face which to me is almost, if not quite, pathognomonic of the obstruction in question. Briefly it consists in this—elevation and eversion of the upper lip, the alæ of the nose being at the same time raised at their junction with the cheeks, this point being also apparently more sunken than usual; as well as a deep furrow running downwards from the nostrils towards the angle of the mouth.

Now this appearance is not to be confounded with the type of face so commonly met with in strumous children, which it somewhat resembles, which moreover is frequently found in connection with the various forms of chronic rhinitis; for we find the appearance of which I speak developing in

after-life, when it is clearly the result of an adventitious nasal obstruction. The thick everted lips of the strumous child, the sunken alæ, the prominent cheeks, with the depressed point of origin of the nose from the forehead, and the nostrils directed slightly forward, form a distinct and unmistakable picture.

the strumous aspect

But to what is due this expression which I have said is almost pathognomonic of obstruction in the middle meatus? To answer this question we must for a minute consider, step by step, the course normally pursued by the indrawn current of air.

Course of the inspiratory current of air

The expansion of the lungs causes a rush of air vertically downwards from the naso-pharynx. This current, from the direction of the epiglottis backwards and upwards, must necessarily sweep over the posterior and lateral walls of the naso-pharynx, and leave a vacuum in the highest as well as the lowest regions. The vacuum is immediately filled by air passing along the various channels of the nose, which incline slightly downwards as they pass backwards. This movement in its turn causes the external atmosphere to pass more or less directly upwards, as well as backwards, through the nostrils.

Now the external orifice of the nostrils is placed at a lower level by a quarter of an inch or more than the entrance to the floor of the nose, an arrangement which obviously gives the indrawn current of air an upward direction, instead of allowing it to pass directly backwards through the inferior meatus. This is a fact which may be submitted to the simplest experiment. If with an odoriferous substance beneath the nose we inhale its particles, first with the nostrils merely distended, and secondly with the alæ raised, we find that the olfactory region is far more stimulated in the former than in the latter case; the ex-

Physiology of olfaction

planation obviously being that when the orifice of the nostril is raised on to a level with the entrance to the inferior meatus, the air passes more readily backwards than upwards, and so avoids the olfactory mucous membrane. Indeed, in the presence, say, of bisulphide of carbon, we instinctively raise the alæ, or, as we say, *turn up the nose;* while on the contrary, when anxious to abstract the full quotum of sweetness from a rose, we merely dilate our nostrils, and perhaps even depress them. Or again, when we wish to express our contempt for a professional brother, we raise one ala only, by which, in a very delicate manner, we tacitly insinuate that we do not like the smell of him !

The pathological expression under discussion, indeed, we may call briefly a slight *turning up* of the nose. Respiration being obstructed through the middle and superior channels, an effort is made to facilitate the passage of air through the inferior meatus by bringing the external opening of the nostrils more on a level with the osseous entrance to the floor of the nose. The muscle by which this compensatory movement is effected is the *levator labii superioris alæque nasi*, which not only raises the ala and upper lip, but also slightly everts the latter, seeing that its *fasciculi* are inserted in the lip superficially to the bulk of the *orbicularis oris*. And it is by a persistent shortening of this muscle that the permanent expression indicative of obstruction in the middle meatus is produced. But remark, that although in this peculiar physiognomy the mouth is kept slightly open by elevation of the upper lip, yet the respiration is obviously nasal and not buccal. The latter I shall consider presently, when I have discussed the other objective sign in connection with obstruction of the middle meatus, for which, as I said, we must look in the pharynx.

levator labii superioris alæque nasi

The expression not to be confounded with buccal respiration

Briefly, it is a dried, shrivelled *appearance* of the mucous membrane on the posterior wall of the pharynx. I emphasize "appearance" advisedly. For if we pass a piece of cotton wool over the surface in question, a thin film of inspissated mucus will peel off, leaving the membrane beneath in its naturally moist condition, granular, atrophied, or hypertrophied, as the case may be.

Pharyngitis sicca symptomatic of obstruction in the middle meatus

Now this so-called *pharyngitis sicca* is, in a large number of cases, symptomatic of swelling of the middle turbinated tissue and obstruction of the middle meatus; and it results, as appears to me, from the inspired air, instead of circulating among all the moistening interstices of the nose, passing directly backwards along the inferior meatus and impinging on the posterior naso-pharyngeal wall in an abnormally dry condition. And not only this: but just as a river flows more rapidly as its channel narrows, so does the inspiratory current pass along the inferior meatus with an abnormal velocity, and striking on the first moist surface it meets with unusual momentum, it rapidly dries it, and leaves the film of dried mucus. This dry appearance, in fact, is confined to the posterior wall: we never find the pillars or palate sharing in the trouble; and when swelling of the middle turbinated tissues is the cause of it, we see that the dryness, on examining with the post-rhinal mirror, affects the mucous membrane opposite the opening of the inferior meatus, extending from that point downwards.

In passing, I must remind you that *pharyngitis sicca* is in the text-books, if not described as an affection *sui generis*, then spoken of as an accompaniment of atrophic or granular pharyngitis. But when you have met with it a few times you will be convinced, seeing it even in the so-called hypertrophic conditions, that it is, in a large proportion of cases, really a symptom of nasal obstruction.

But we do not find *pharyngitis sicca* invariably when we have the peculiar physiognomy which I have just described. The latter may be due to the presence of polypi, which always excite a watery catarrh, in itself more than sufficient to prevent any drying of mucus; or we may find the obstruction as part of a catarrhal rhinitis, which also prevents the development of the symptom. On the other hand, the *pharyngitis sicca* may be but part of a *rhinitis sicca*, in the early stages of which we have indeed great inflammatory thickening of the middle turbinated tissue, although in the later stages the spongy bones themselves have all but disappeared. But although in the latter case we may succeed in restoring the normal secretion—a result, by the way, very seldom attained—yet the inspired air still reaches the pharyngeal wall unmoistened from the abolition of the turbinated bodies and their functions, and we still have our *pharyngitis sicca*. However, in spite of all these qualifications, I advise you, whenever you see a pharynx with a tendency to dryness, to examine the condition of the middle turbinated bodies; for their swelling is often the sole cause of the dryness in the throat of which the patient complains; and by a knowledge of the pathology we may cure our patient. Nor is this all. We never find this *pharyngitis sicca* without more or less chronic laryngitis; and I think I may even say that we never find obstruction of the middle meatus, whether the posterior pharyngeal wall be dry or not, without a certain amount of laryngeal irritation, and that sometimes of a very serious nature. Those of you who have attended my clinic have seen several cases where the aphonia for which the patient sought relief has succumbed only by treating the nasal abnormalities. And when we remember that the nose has the definite function of moistening, warming, and filtering

Chronic laryngitis frequently due to nasal stenosis

the inspired air, it only stands to reason that, if this function be abolished, the first structures which the inspired air meets will suffer. So that in every case of chronic laryngitis, we must examine the condition of the nasal mucous membrane.

Buccal respiration

And now for a word on the true buccal respiration and allied symptoms. They are met with chiefly in children the subjects of post-nasal neoplasms and enlarged tonsils, who are brought to us generally with the complaint of deafness. Sometimes the buccal respiration is caused by persistent tumefaction of the inferior turbinated bodies, a condition also occasionally met with in children; while less frequently polypi and deflection of the septum produce complete nasal obstruction.

appearance of stupidity.

In true buccal respiration the patients, chiefly from dropping of the lower jaw, but partly also from the frequently concurring deafness, have a singularly stupid appearance, and often actually lack the average intelligence of their age. This must be due in great measure to the general condition of faulty nutrition induced by imperfect preparation of the inspired oxygen for combustion to which I have already referred. For we must not forget that oxygen is as necessary to combustion as carbon; and that nasal obstruction is to the former element what œsophagal stricture would be to the latter.

But in connection with the nasal obstruction met with as the cause of buccal respiration there is another objective symptom which invariably accompanies the latter, and is sometimes of great value in suggesting the course of investigation to be pursued even when the mouth is not habitually held open. I refer to a semi-collapsed condition of the alæ, and more especially to a dimple on each side of the median line, nearer the point of the nose than the

semi-collapse of alæ

osseous framework. It is situated, I imagine, at the angle between the superior and inferior lateral cartilages, and is the point which, from lack of adequate support, most conspicuously reveals the abolition of function on the part of the special muscles of the nose. Briefly, the nose has in cases of buccal respiration a pinched appearance, almost pathognomonic. Yet occasionally an onlooker will remark rather the apparently great breadth of the bridge of the nose. But this is obviously only relative to the narrowness of the alar portion.

almost pathognomonic

While still on the subject of the physiological consequences, if I may so style them, of nasal obstruction, I may advantageously refer to the function performed by the erectile tissue on the inferior turbinated bone. For the swelling of it, as I have already remarked, is a physiological phenomenon, and as such, we must suppose, performs a definite office. The passage from a warm to a cold atmosphere is sufficient to fill the plexuses with venous blood. If, as we have seen, swelling of the middle spongy body forces the air to traverse in preference the inferior meatus, correspondingly we must assume that obstruction in the latter, will cause the indrawn current of air to circulate more freely among the higher tortuosities of the cavity, the purpose served obviously being a more thorough warming of the cold air.

Function of inferior turbinate body.

There is one more objective symptom of nasal obstruction to which I will refer, namely an apparently paretic condition of the soft palate, which hangs down, away from the posterior wall, and responds but feebly to tactile stimulation. It is not by any means pathognomonic of obstruction, being frequently observed as an accompaniment of post-nasal catarrh. In fact it should be regarded as a concomitant of catarrh, rather than aught else; and its

The paretic palate

occurrence is sufficiently explained by the supposition that the muscular tissue is in a state of congestion no less than the overlying palatine glands. In dry rhinitis it is seldom observed, a fact which almost substantiates the hypothesis.

I will briefly recapitulate the symptoms of nasal obstruction, and then pass on to consider the different diseases which cause it.

recapitulation of symptoms

The patient complains of stuffiness in his nose, chronic cold, and inability to clear his head, although he use his pocket-handkerchief constantly. He snores at night, his voice is unresonant and his gutturals blunted; he has difficulty in mastication and swallowing; he is possibly anæmic and otherwise badly nourished. Olfaction is more or less interfered with. He has a peculiar physiognomy, varying from a slight elevation of the upper lip and alæ nasi to complete buccal respiration with the pinched nose. He may suffer from a dry throat, and hoarseness or aphonia. He may have headache, asthma, and other nerve phenomena, or signs of obstruction of the naso-lacrymal canal. Finally, there may be no direct symptoms at all.

The forms of obstruction met with under the comprehensive term *chronic rhinitis* are numerous enough, although we may class them in two divisions—(1) obstruction arising from swelling of the inferior turbinated body, and (2) that originating in swelling or hyperplasia involving the middle spongy tissue. This division, although broad and rough, has yet a pathological value which we shall appreciate as we proceed. More accurately we may subdivide chronic rhinitis in the method I have already mentioned. Let me remind you:—

(*a*) Chronic catarrhal rhinitis with vascular tumefaction, which involves chiefly the inferior turbinated tissue;

(*b*) Chronic catarrhal rhinitis with hyperplasia, involving chiefly the middle turbinated tissue.

This in its turn leads to—

(i) Dry hyperplastic rhinitis ;

(ii) Dry atrophic rhinitis.

Chronic catarrhal rhinitis with vascular tumefaction

(*a*) *Chronic catarrhal rhinitis with vascular tumefaction* is one of the commonest affections met with. We see it passing through various stages, from the simplest persistent hyperæmia of the mucous membrane, to that form where all the special structures and functions of the nose are completely destroyed.

We find the affection for the most part in children of a strumous habit, perhaps less frequently in adults, and even more rarely in individuals past middle life. When I say it belongs to the strumous diathesis, that is almost equivalent to ascribing it to the persistence of an acute catarrh, seeing that by *struma* we signify little more than an inability to recover from acute inflammation. We have all the signs of nasal obstruction in varying degree, buccal respiration, snoring, &c., being frequent in children, who are not uncommonly deaf from implication of the Eustachian tubes. In older patients, as well as deafness, there may be hissing tinnitus from the catarrhal condition having extended to the tympanum. There is usually, especially when obstruction is most marked, no great amount of secretion, although the child may be constantly picking his nose to remove the dried plugs which collect in the vestibule. Sometimes, however, there is a thin watery discharge. Occasionally the pocket-handkerchief will reveal streaks of blood ; but there is seldom real epistaxis. So far the subjective symptoms are not different from those of post-nasal neoplasms and enlarged tonsils.

Symptoms :

Subjective

On examining the anterior nares with the speculum, we

frequently see, especially in children, the inferior turbinated body altogether preventing any further view. Investigating the swelling with a probe it gives the sensation, as I have already remarked, of a bag loosely filled with fluid; while if we spray it with a ten per cent. solution of cocaine, the tumefaction subsides to a greater or less degree, and we may thus make a further examination. The swelling is moist, generally homogeneous, but sometimes granular, and of a pale or dark-red colour. In old standing cases we may find hard papilloma-like bodies clustered anteriorly about the free margin of the body. The latter, also in old cases, may present a greyish-pink, translucent aspect, when it may readily be mistaken for a mucous polypus; but this is a variety not often met with. The tactile sensation is generally, but not always, diminished.

Objective

inferior turbinate body chiefly affected

Examining the posterior extremity of the same body with the rhinal mirror, we discover swelling to as great or even a greater degree; but the appearance is more varied. The colour is usually lighter than that of the anterior extremity, while it is sometimes a pale grey and quite polypoid in appearance. More rarely the colour is dark-red or bluish. In any case the surface may be granular or lobular to a marked degree, and in the darker variety the appearance is generally and very correctly styled *mulberry-like*. Occasionally these dark-red lobulated bodies are of such size that they project into the post-nasal space, conceal the septum by their approximation, and even obscure the choanæ altogether. If we make a digital examination by passing the forefinger behind the soft palate, so unsubstantial do we find them to be that we can feel nothing but the hard posterior extremity of the bone; while if, by the help of the finger in the naso-pharynx, we endeavour to slip over them a stiff wire snare passed through the

mulberry-like swelling of posterior extremity

anterior nares, we make the astonishing discovery that there is nothing to bring away. Nevertheless, the operation is frequently effectual in removing the obstruction although there is nothing to show for it; and we are driven to the conclusion that the tumefaction is possibly due to a high degree of œdema, or less likely to the development of cysts. I know of no microscopical researches into its true nature, the difficulties being sufficiently obvious.

Middle turbinate body

The middle turbinated bodies also take part in the general tumefaction of the mucous membrane. But the development of erectile tissue in these situations being quite insignificant as compared with that on the inferior turbinate bones, we find their swelling under simple irritation much less pronounced, although sufficient to make them abut on the septum. The venous plexuses lying on latter are also swollen, and the mucous membrane inflamed.

floor

The floor of the nose seldom presents any noteworthy changes, although small red elevations are sometimes observed anteriorly.

Course

The *course* of chronic rhinitis is slow, and varies much with the state of the barometer, being troublesome when it falls, and *vice versâ*. The affection has little tendency to spontaneous cure, except in so far as improved general health will expedite recovery. The probable tendency of all cases is in the direction of hyperplastic rhinitis, with, ultimately, either the abolition of function as the natural consequence of excessive stimulation—that is to say, dry rhinitis, ozœna and atrophic changes; or with the development of polypi. Of the anatomical connection of these different states I shall speak when I discuss their pathology.

Diagnosis

The only possibility of a mistake in *diagnosis* is to confound the simple vascular tumefaction with polypus, a blunder almost incredible to any one accustomed to a good

light, a good speculum, and a handy probe: yet the error is frequently made. It is more excusable when the anterior swelling of the inferior turbinate body is of long standing and has the greyish appearance I have mentioned. But even here the probe will remove all doubt; for the tumefaction, though perhaps seemingly movable and pitting under pressure, is fixed and not pedunculated. It may also help us to remember that polypi are rare in children, although the persistent and extreme tumefaction of the inferior turbinated tissue is fairly common. Lastly, this erectile tissue will subside under cocaine, which of course has no influence over polypi.

Prognosis

The *prognosis* is favourable, although the treatment is sometimes difficult. If the disease is left to itself it leads to such complications as deafness, from implication of the Eustachian tubes, probably post-nasal vegetations, arrest of development in the thorax, with the formation of pigeon-breast, as in the case of enlarged tonsils, and a general condition of malnutrition.

Treatment:

The *treatment* of simple chronic rhinitis consists in the first place in keeping the nose clean with alkaline or saline douches, and placing the patient under the special hygienic conditions suitable to his constitution. He must avoid cold and damp, close rooms, and dust, sedentary occupations and over-fatigue.

palliative

While I attach great importance to cleansing the nasal cavities, I must warn you against prescribing douches and sprays indiscriminately for every case. Where the flux is profuse there is no fear of accumulation of inspissated mucus; and we must remember that most chemical substances, even pure water, destroy the action of the cilia, and ultimately these bodies themselves; while the olfactory mucous membrane, though devoid of cilia, is even more

susceptible to the action of such destructive agencies. The *lotio alkalina* of our pharmacopœia is always very acceptable to patients; but I have failed to see any permanent benefits accruing from its use, although the out-patient assures us that it "clears his head beautiful." So I think it a pity to apply anything to the nasal mucous membrane that will not offer some hope of altering the morbid condition.

curative

Very weak astringents, such as half a grain of alum to the ounce, applied through an atomizer, will sometimes effect a cure; or, on the contrary, in children we may paint the anterior extremity of the swollen inferior turbinate body with a strong astringent, such as glycerine of tannin, once in the twenty-four hours with great benefit. The nasal

buginaria

bougies of our pharmacopœia are sometimes serviceable. They dissolve slowly in the nasal cavities and bathe the mucous membrane with the drugs contained in them. Those of acetate of lead (gr. $\frac{1}{2}$), morphia (gr. $\frac{1}{10}$), or of bismuth, are particularly serviceable.

Where the vascular tumefaction persists in spite of such applications, we may sometimes gain much by the daily passage along the inferior meatus of a soft rubber bougie.

bougies

The patient may even be taught to apply it himelf. The largest size that can be comfortably passed should be retained for five minutes or so, and then a larger one substituted; and so on until the passage is comfortably free. We must remember that the normal width of the fossa varies much in different individuals.

Finally, in the way of radical cure, we may have recourse

caustics and galvano-cautery

to linear cauterization of the swollen tissues with the galvano-cautery, or to a limited use of such caustics as chromic acid or London paste. If we desire to contract the tissue filling the concavity of the inferior turbinated bone, we may

pass along it a probe covered with absorbent wool, saturated with a small quantity of chromic, glacial acetic, or nitric acids. The first of these appears to cause the least pain. Superfluous acid should be immediately removed by a piece of wool wrapped round a second probe. None of these operations give rise to much inconvenience, least of all the galvano-cautery. They will probably require repetition at intervals of a week or so for a few sittings, when a cure will be effected. If the catarrh is the most urgent symptom, it may be relieved by inhalations of creasote or cubebs, weak astringent sprays or morphia buginaria. In some cases I have found chromic acid ($\frac{1}{4}$ or $\frac{1}{8}$ grain to the ounce) very serviceable as a spray.

Chronic catarrhal rhinitis with hyperplasia

(*b*) And now we arrive at our next division of chronic rhinitis, namely, that which I have styled *chronic catarrhal rhinitis with hyperplasia*. It is a condition beyond that of simple chronic rhinitis with vascular tumefaction, intermediate between it and dry rhinitis on the one hand and polypus on the other. It is swelling especially over the middle turbinated bone, in which not only the erectile tissue is involved, although to a less degree, but real hyperplasia of the mucous membrane exists with cell-proliferation and its consequences. It is a form of chronic rhinitis, while exceedingly common, yet frequently overlooked, and may exist almost *per se*, without much alteration in the other structures of the nose. Its symptoms are indefinite, and sometimes wanting, and seldom referred to the nose. But as I have already informed you, the patient may suffer (as, I may say, a physiological consequence) from *pharyngitis sicca* and chronic laryngitis in every stage. The sense of smell is not as frequently vitiated as in the case of polypi, although it is always and inevitably more or less impaired. In minor cases there is but a slight swelling of the anterior

affects chiefly the middle spongy body

and is frequently overlooked.

Minor cases

third of the free margin of the middle spongy body, but sufficient to bring it in contact with the septum. In extreme cases we see in place of the middle turbinated body—the free margin of which should appear to hang down from the vault—the whole of the middle channel obstructed by a soft, scarcely movable swelling abutting on the septum, and reaching almost down to the inferior turbinated body; and between these two extremes there is every degree of variation. The affection is generally bilateral, although it is frequently more pronounced on one side than the other. Indeed, one may see the two sides of the nose in such different stages of what we must suppose to be essentially the same affection, that while one choana is crowded with polypi, the other is in a stage of incipient dry rhinitis, the channel in the middle turbinated bone being completely occluded with the tissue to which I refer. The posterior extremity may or may not be involved in the tumefaction.

Aggravated cases

not always symmetrical

While this hyperplastic rhinitis may undoubtedly be a further condition of simple chronic catarrh, yet the etiology of the two is not always the same; and we frequently find swelling of the middle turbinated tissue without any great amount of catarrh, and without any vascular tumefaction of the inferior turbinated body. While the latter is, I believe, always due to a persistent cold, so to speak, this hyperplastic swelling of the middle turbinated tissue is due frequently to contact of irritant particles contained in the inspired air. Granted that the current of the latter takes an upward as well as backward course, the first obstacle on which it impinges is the anterior third of the middle spongy bone, especially if the inferior turbinated body is in a condition of tumefaction. In fact, this anterior third is the very portion first attacked; and sometimes, indeed, we find it covered with the dust to which the

frequently caused by direct irritation

patient is exposed. The most extreme degree of this affection I have ever seen occurs in a case I will presently show you, although the patient's condition is now very different from what it was when she first came under treatment. Her work consists in preparing furs, and it exposes her to great quantities of dust. She came complaining of aphonia. She had chronic laryngitis, *pharyngitis sicca*, and great swelling of the middle turbinated body, so great, indeed, that the middle meatus was completely obstructed, as well as, necessarily, the passage into the superior meatus. The case is rather one of dry rhinitis, which conducts me to the next subdivision of chronic rhinitis. But as the consideration of this involves the discussion of certain pathological points, I will postpone it to my next lecture.

Case

Lecture 2.

GENTLEMEN,—At the close of my last lecture I referred to a case which I trust you were all able to see for yourselves, but which I regret was not as it appeared before submitting it to treatment. As I then told you, when the patient first came under observation, complaining of loss of voice and dryness in the throat, the whole of the middle meatus on both sides was blocked with a red, slightly lobulated, semi-transparent swelling. On examining it with a probe one found it to be soft and yielding, although immovable from the structure to which it was attached. But there was a further objective sign, not often found indeed, but of great importance from its diagnostic, prognostic, pathological, and therapeutic value. When I gently pushed the probe, which for such a purpose must not have a bulbous extremity, through the epithelium covering the inflammatory neoplasm and deeply into its substance, my instrument was arrested by what even a hospital dresser would unequivocally pronounce to be carious bone. We have in fact what Virchow calls an *ostitis granulosa* of the middle turbinated bone. In some cases the caries may have totally destroyed the thin bone in spots, so that the probe will pass right through it without encountering its substance; and in other cases the probe will as unmistakably reveal the presence of minute osteophytes, rather, however, on the free border than the under surface of the

Ostitis granulosa

Osteophytes

bone. In this case we must assume the existence of osteoplastic periostitis, which, as we know, may be met with in other situations in combination with superficial caries without suppuration.

Pathological anatomy of bone inflammation

I think it will not be amiss in this place, before proceeding further with my systematic description, to say a few words concerning the pathological anatomy of the various degrees of inflammation as it attacks the middle spongy bone and its coverings.

Let me remind you of certain anatomical facts concerning the normal structures. The pituitary mucous membrane is highly vascular, especially towards the free margin and anterior and posterior extremities of the middle turbinated bone. It is covered with columnar ciliated epithelium, and contains, visible to the naked eye, the openings of numerous racemose glands. Its connective tissue, little elastic, is inseparably united with the subjacent periosteum, which scarcely forms a distinct structure. The bone itself is minutely and closely perforated with foramina for the passage of arterial twigs from one surface to the other, a fact of considerable importance, as will be presently seen.

intimate connection between mucous membrane and periosteum

Well, then, you will readily understand, when this intimate connection of mucous membrane with periosteum is considered, that there can hardly exist any degree of inflammation in the one without the other suffering. And when we also call to mind the exposed position of the structure under consideration, arresting as it does cold air laden with mechanical, biological, and chemical irritant particles, and not perpetually swept clean as is the conjunctiva by the eyelid, we can only suppose, *à priori*, that it must frequently succumb to inflammatory attacks. But however intense the inflammation of the periosteum may

Necrosis probably never results from simple inflammation.

be, and sometimes it is sufficient to give rise to excruciating pain, it is never in ordinary attacks followed by necrosis. And why? Probably because both surfaces of this delicate bone are seldom attacked together, and the blood-vessels of the one side have as much to do with the nutrition of the other as of itself, the arterioles anastomosing through the foramina of which I have just spoken. I am speaking now of simple inflammation: in syphilitic and perhaps scrofulous inflammation both sides may be simultaneously so gravely attacked that greater or smaller portions of the bones necrose. Such pieces are either shown us by the patient, or are found lying loose in the fossæ. But as the consequence of simple persistent rhinitis, which so far as my observations go is nearly always confined to the free border and under surface, necrosis never results.

But what, then, has happened in those cases of dry atrophic rhinitis—to which I shall presently refer—where there is no trace left of any middle turbinated bone at all, and which we have no reason to refer to syphilitic agency?

ostitis granulosa leads to atrophic rhinitis.

Simply what we should expect to happen in a case of *ostitis granulosa* or caries without suppuration. The pathology, indeed, is identical with that of certain cases met with in connection with the long bones, where we find a mass of granular tissue through which a probe may be pushed until it impinges on the carious bone; and this condition may obtain without the development of any pus. I believe the granulation tissue in the case of the middle turbinated bone may absorb all the bone salts and dissolve the connective tissue without producing any breach in the epithelium covering the fungous mass, or any purulent discharge or ozœna.

The minute pathological processes of chronic hyperplastic rhinitis are simple enough. The sub-mucous connective

tissue, in consequence of prolonged irritation and arterial stagnation, becomes infiltriated with small round cells, while the fibrous elements swell and lose their toughness, or are dissolved and converted into a gelatinous intercellular substance. The blood-vessels increase in size and number, while the mucous glands also probably enlarge and even become more numerous. If the inflammatory process partially subside, the inflammatory infiltration assumes a higher form of structure, and the serous infiltration disappears. The new cells partly form fibres and partly are absorbed, and we have a condition left of *hyperplasia* in which new tissue, similar to the old, is superadded between the layers of the latter. Pathology

But if the inflammatory process continue, the connective tissue becomes wholly replaced by this new granulation tissue. The periosteum also breaks down under its assaults, and even the connective tissue of the Haversian canals succumbs. Then follows gradually the absorption of bone salts, bone tissue, and osteoclasts by this new growth, and we have a superficial *ostitis granulosa;* while if we thrust a probe through the mass of granulations, it impinges on carious bone. This conversion of the connective tissue of periosteum and Haversian canals into granulation tissue will ultimately cause the entire absorption of the delicate middle spongy bone, a condition which, as I have said, we do occasionally meet with; and we correctly name it *atrophic* rhinitis, without having any very clear idea as to its significance, or the importance of preventing its development when we discover the earlier stages of bone inflammation which lead to it.

I trust, gentlemen, you will not accuse me of being theoretical as distinguished from being practical. It has always appeared to me in the first place necessary to

The lack of precision has led to absurd therapeutic blunders.

discover what a pathological process is before we can hope to apply remedial measures for its arrest. And the lack of accurate knowledge on this head has led some who profess to be authorities in nose disease to perpetrate the most ridiculous and unintelligible blunders in nasal therapeutics. To such errors I shall be compelled to refer in a more suitable place.

And, on the other hand, I trust you will not quarrel with me for reminding you of pathological processes with which you must be as familiar as, at least, I am. But I thought it advisable to recall to you certain inflammatory changes that occur in bone everywhere, and then to put it whether the same process must not perforce attack the middle turbinated bones of the nose, exposed as they are to sources of inflammation experienced by like tissue in no other part of the body, and whose very nature renders them highly susceptible to attack. The pathology of simple chronic inflammation in this situation is also of considerable importance as bearing on the development of mucous polypi, as we shall subsequently discover.

But now let us return to the clinical features of hypertrophic rhinitis. I have referred to the use of the probe, where we have a mass of inflammatory growth blocking the channel of the middle meatus: if it discover carious bone we must be on our guard lest the atrophic form appear; if the bone is not attacked we may be less anxious, although scarcely less energetic in our treatment.

Transition from catarrhal to dry rhinitis

(i) Gradually, from a state of hyperplasia with excessive or only normal secretion, we pass into one where the mucous glands, partly from destruction by the inflammatory action, partly from former over stimulation, strike work, and the mucous membrane is affected with dry rhinitis. Then the patient's trouble begins. For if there was a tendency to

Dry hyperplastic rhinitis

pharyngitis sicca and chronic laryngitis before, these become greatly intensified now. For the inspired air reaches the pharynx and larynx no whit the better for passing through the nose, which is dry and can neither give moisture nor abstract impurities. Then from the retention of the viscid secretion, which forms hard crusts hanging about the turbinate bodies and septum,—a retention partly due to the scanty secretion, partly to the destruction of the cilia which should sweep it backwards, putrefaction sets in, and the resulting fœtor makes the patient's life wretched to himself and his presence hateful to his best friends. And it is solely for his "bad breath" very often that he seeks our aid. The ozœna must be distinguished from that due to syphilitic necrosis of the nasal bony structures. It is not possible to describe the difference in words, although it is real enough to those who are accustomed to experience both. The difference is quite intelligible when we remember that in dry rhinitis the smell is due to the crusts of muco-pus, which putrefy simply because they cannot be washed away; whereas in syphilitic affections it is due to putrefaction of pus contained in the interstices of necrosed bone. A point of some value in diagnosis is that thorough cleansing will remove the stench of dry rhinitis, while no amount of douching will destroy that of necrosed bone. So that we must not suppose every case of ozœna to be one of dry rhinitis: far from it. A certain amount is a very common termination to an ordinary attack of acute rhinitis, and is then, I believe, always more perceptible to the patient himself, during expiration, than to others. Similarly, we sometimes discover it in cases of chronic catarrhal rhinitis. In such cases it more readily succumbs to treatment than in cases of dry rhinitis. Then, again, in the matter of

distinction between the ozœna of rhinitis and that of syphilitic necrosis

diagnosis we must not mistake the stench met with in a patient who has just been regaling himself with onions, cut Cavendish, and whiskey toddy! Indeed, this vicious and not uncommon combination of odours may readily be mistaken for ozœna, especially if there be at the same time any nose trouble.

appearances in naso-pharynx.

If we examine the naso-pharynx, we find the same deficiency of secretion, and sometimes actual crusts. Tenacious muco-pus hangs about the vault and septum, while the lower part of the posterior wall is covered with a film of inspissated mucus, as I have already related.

Etiology

To the possible *causes* of dry rhinitis I have already referred. Dry rhinitis is frequently accompanied by a most distressing condition of general health, though which is the primary trouble it may be difficult to say. At any rate, both the local trouble and the general symptoms react on one another; while if we can improve the one, the other is more or less benefited. Besides the symptoms referable to the throat trouble, such as aching, dysphonia, functional dysphagia, &c., the patient's digestion is variously disturbed. She complains of headache, drowsiness, and inability to sleep soundly. She is both nervous and hysterical; and often, though there is chronic laryngitis, the aphonia or dysphonia appears to be at least partly functional. Such symptoms are supposed by some to be of a reflex nature. If we inquire into her previous history, we find some more tangible cause than the nose trouble for her general condition. The cares of maternity, a series of unhappy love affairs, a hard task-mistress, or an inherited tendency to worry over petty annoyances; these, and such-like, will account for much of the nervous debility —an expression I employ for want of a more scientific— and anæmia from which the patients suffer. You will

distressing condition of general health

gastric and neurotic disturbances

observe that I speak of the patient as *she*. We do not often see a man with dry rhinitis; but I believe most cases in males are the result very much of over-work. women more often attacked than men

Perhaps it is especially in strumous individuals that rhinitis reaches this stage. The tendency to it in some cases is apparently hereditary; at any rate we can say so of ozœna, without being more precise as to the pathological lesion. Nevertheless, there is good evidence to show that the affection is not contagious. Possibly, when several members of a family are attacked, there is a syphilitic element; or at any rate we may safely assume the existence of struma. But the whole question of etiology is a difficult one, and as I have no views of my own on the subject, I must refer you to the various text-books. heredity

Although I have spoken more of the general condition of adult sufferers, dry rhinitis is said to be most frequently met with in young persons between the ages of ten and twenty; that is, roughly speaking, during the period of adolescence. But I am inclined to think it is more common in persons of riper years than is usually supposed; and I think it possible that in these it is frequently overlooked, seeing that ozœna is not so common an accompaniment, and that the patients seek relief for hoarseness or dryness in the throat. I showed you at our last meeting two such cases, one, a patient of five and thirty, and the other of thirty, both of whom sought relief for their aphonia. Dry rhinitis is certainly more common in women than in men. In this hospital we notice that there are nearly twice the number of female as compared with male sufferers. I may remark here that it is frequently noticeable in young girls who menstruate regularly that the ozœna becomes intensified at the approach of their periods. age

There may possibly be some connection between this fact and that which makes some people assert that they know when a woman is menstruating by the odour of her breath.

duration

The *duration* of dry rhinitis can hardly be stated. It persists for many years, showing no tendency to spontaneous cure. Many cases probably pass, if untreated, into the atrophic form, when the symptoms become aggravated. Nevertheless, although ozœna, a term for the most part synonymous with dry rhinitis, is generally held to be an incurable malady, yet the fact that a large majority of cases occurs in young people, whom the disease does not kill, appears to assert that they recover. Or do they give up attending us because we do them no good? Such is not the general experience with regard to other affections.

spontaneous recovery probably occurs in a certain number of cases

Dry atrophic rhinitis

(ii) In the atrophic form of dry rhinitis the turbinated bones may be almost or quite destroyed, while the mucous membrane when freed from its crusts has a pale shiny appearance, its sub-mucosa being actually in a state of cirrhosis. The atrophic process may occupy many years—how many it would be difficult to say; or, on the other hand, it may be comparatively acute, as in a case which has been proceeding under my observation, and which I showed you after my last lecture. But all cases of dry rhinitis do not necessarily become atrophic; nor does the dry stage always precede the wasting.

See note on atrophic rhinitis, page 81

diagnosis

No mistake can possibly be made in *diagnosing* dry atrophic rhinitis. The roomy fossæ enable us to see the posterior wall of the naso-pharynx, and even the Eustachian orifices. The posterior wall of the pharynx is dry, as in obstruction of the middle meatus; for although there is room enough for the inspired air to circulate in the upper part of the nasal cavities, yet the moistening function is entirely in abeyance, and hence the desiccation of the

mucous membrane. We invariably find more or less chronic laryngitis, often of the dry variety.

Great quantities of greenish or blackish plugs of dried stinking mucus collect at the upper part of the spacious fossæ and are discharged only at intervals measured by the number of days, or even weeks. There is little or no disposition to use the handkerchief. Though the atrophied membrane is so little vascular, it often bleeds readily and is fairly sensitive.

Treatment

And now as to the *treatment* of these cases of true hyperplastic rhinitis. The tendency with many practitioners is to ignore the condition if it produce no very obvious symptoms. They forget the physiological importance of the nose, and its intimate relations with other organs. Yet the treatment is simple and satisfactory; and often a tendency to pharyngitis sicca with chronic laryngitis will not be ameliorated until the passage into the superior and middle channels is freed of obstruction. I think in nasal surgery we ought to remember Carlyle's definition of dirt—"matter out of place"; and any proliferation of tissue should be looked upon as dirt and removed.

galvano-cautery

This destruction of hypertrophied mucous membrane is most readily effected with the galvano-cautery, which, however, needs some skill and discrimination in its employment. If, for instance, it is the free border of the middle turbinate body that is enlarged, I prefer, where there is a choice, to destroy the inner, rather than the outer side. And for this reason: if we destroy the under surface of the body, mucus very readily dries and accumulates there in consequence of the destruction of the mucous glands; whereas if it is the inner side which is burnt, mucus still pours down from above and keeps the cicatrized surface

choice of site to which it should be applied

caution

moist. But in cauterizing the inner side we must be very careful to apply our burner only to the diseased spot, and avoid bringing it in contact with the septum; else we may find at the patient's next visit that the septum and middle turbinated body are inseparably united, and that we have done more harm than good.

To assist the operator in avoiding so grave a blunder, I have devised a shield which can be placed and held in any spot at will, leaving both the surgeon's hands at liberty.

a new shield, see Plate II

It consists of a small ivory plate measuring half an inch or so in diameter, and attached to a flexible probe. On each inner side of an ordinary Thudichum's speculum is fixed a spring, lying close to the blade and turned a little inwards at the free border. Under this spring we can readily hook the probe after the shield has been placed on the spot we desire to protect, by bending it to the suitable angle.

treatment of flaps of mucous membrane, and polypoid degeneration of posterior extremity of inferior turbinate body.

When the hypertrophied mucous membrane depends in a flap, we may find a hard-wire snare the most serviceable instrument for its removal. This also does good work in destroying the polypoid, cystic degeneration of the posterior extremity of the inferior turbinate body. For this purpose we must use Mackenzie's cog-wheel instrument, which, passed along the floor of the nose, can be held and tightened with the right hand while a finger of the left, thrust behind the velum, holds the loop over the swollen tissue. As I remarked in my last lecture, such a procedure often brings away nothing, although the enlargement has completely collapsed. Hypertrophied mucous membrane is often highly vascular, especially when arising from the inferior spongy body. Bleeding consequently may be

hæmorrhage sometimes profuse

rather profuse after operating; and to obviate this we must tighten our snare very slowly. For very slow work Jarvis's instrument is preferable to Mackenzie's. But as a rule I

remove with the latter every abnormal structure that can be snared; failing this I employ the galvano-cautery.

In those cases where the probe, thrust through the swollen tissue filling the concavity of the middle turbinated body, impinges on carious bone, I employ a different method. The whole of the surface which appears to be diseased I scrape with a sharp spoon down to the bone itself, and dress with iodoform insufflations. There is subsequently some pain, but not very much, and the mutilated surface granulates and heals with surprising rapidity. I will show you a case presently that I have dealt with in this manner with the happiest results: we can no longer thrust a probe on to carious bone; but although the condition of dry rhinitis is much ameliorated, a cure is by no means effected, and we must trust for further improvement to our pharmacopœia. And here I must refer to an alternative method of treatment, if only for the sake of giving it unqualified condemnation. And in order to impress this upon you, allow me to say that I have had ample opportunity of observing its results in the hands of its chief, and, as far as I know, its only advocate. I refer to the ablation of the middle turbinated bones. The operator discovers evidence of what he calls *necrosing ethmoiditis* in almost every case of hyperplasia involving the middle turbinated tissue; accordingly, though the rationale is scarcely obvious, he slips a strong cold-wire snare over the anterior extremity of the bone in question, and removes as large a portion as he can include in the noose. For my own part I believe that there is an important function in every structure of the body, notwithstanding the fact that it can be removed easily and without the consequences being fatal; and I prefer to cure the disease in question with physiological facts kept well in view.

treatment of carious bone

ablation of middle turbinated bones

See note on *necrosing ethmoiditis*, page 81.

The galvano-cautery is, as I say, generally all that is needed for simple hypertrophy of the mucous membrane. Where, however, we have a dry, glazed condition, especially if accompanied by ozœna, energetic cleansing of the parts is the first essential to a cure. For this purpose nothing is so effective as the nasal spray, for by no other means can we reach all the interstices of the ethmoid. It is best applied with the compressed-air apparatus, and both through the anterior nares and post-nasal space. If there is much accumulation of dried mucus, it may be advisable to remove it with a syringe, sniffing the solution up the nose, or with the nasal douche. The latter, however, is for many reasons objectionable. When the cavities are fairly cleansed in this manner, it will be advisable to use the fine pneumatic spray at a pressure of about forty pounds. Simply for the rough cleansing, it is not of much consequence what fluid we employ: preferably it should contain an alkali, and some ingredient, such as chloride of sodium, which will stimulate secretion, and so the loosening of the crusts. For the final spraying probably nothing is equal to a weak solution of perchloride of mercury, say 1 in 10,000. In the hands of my colleague, Mr. T. Mark Hovell, it has been productive of the most beneficial results. Very little appears to be absorbed, and I have never seen any constitutional effects from the treatment.

energetic cleansing

Beyond cleansing and antiseptic treatment, which I say is absolutely essential, and which should be carried out if possible by the medical practitioner himself, there are two lines of treatment. First, that of stimulating the mucous glands; and secondly, that of giving them rest by protecting them from external sources of irritation.

two lines of treatment beyond cleansing— (i) stimulation (ii) rest.

For the former purpose we may employ insufflations of

(i) stimulation

various powders. Iodoform may do good service, being at once stimulating and a most powerful antiseptic; or we may give it as a spray dissolved in ether. But the results are not very satisfactory. More encouraging is eucalyptus,—one part of the powdered red gum to two of starch, as recommended by my colleague, Dr. Morell Mackenzie. Other stimulants, such as sanguinaria canadensis or baptisia tinctoria, which latter is also reputed as an antiseptic, are sometimes used. But all stimulants to the nasal secretion appear to me as faulty in principle as are hepatic stimulants to a cirrhotic liver. For whatever purpose we use stimulants, in the long run they defeat their own end. Whether operating on nerve centres, gland structures, or other tissues, stimulants draw upon capital rather than induce honest living upon interest, the natural consequences being bankruptcy. Indeed, many cases of dry rhinitis are unequivocally due to the inhalation of stimulating particles; and at least in such cases the fallacy of further stimulation is obvious enough.

stimulation unscientific

So that I consider the other alternative I mentioned as preferable—namely, that of rest to the diseased structures. To effect this we must prevent the nose from performing its normal functions. And although such a proceeding would appear to react unfavourably upon any co-existing chronic laryngitis, yet, considering the actual state of the nose, this will hardly be noticeable.

(ii) rest

The most efficient means of giving rest to the mucous membrane is to exclude the external atmosphere with its irritating particles. We may use either respirators, which are objectionable on many counts, or plugs of cotton wool, which shall effectually block the entrance of air to the nose.

Gottstein was the first to introduce this method of treatment. His theory of its action I must state, however,

Gottstein's plugs

is diametrically opposed to that of rest. He looks upon the plug of cotton wool as a mechanical irritant which stimulates the secretion of mucus. If it fail to moisten the surface, he assures us it is because the plug is not large enough, and not sufficiently in contact with the mucous membrane. I believe, however, that the improvement which this treatment always effects is partly due to the rest from stimulation, but largely owing to the fact that the drying up of the mucus is prevented. If a mechanical irritant were all that is needed, why do not the plugs of inspissated mucus themselves act as such? Anyhow, the treatment gives the greatest relief to the sufferers. We may enhance the beneficial effect by using medicated wools, saturated, for instance, with iodoform, camphor, boric acid, etc., according to the directions of our pharmacopœia. But I consider it important that we should use the ordinary as distinguished from absorbent cotton wool, so as not to deprive the palate and posterior wall of the pharynx of any moisture that might flow over them.

method of application

The easiest method of introducing the pledget is by means of Gottstein's screws; they assist the efficient introduction, and can easily be withdrawn by unscrewing them from their covering. Wearing the cotton wool even for so short time as two or three hours gives great relief; but they will often be tolerated for a whole night, when the benefit is of course more striking.

Mucous polypi and cysts.

II. And now I must leave the diseases which may unquestionably be placed together under the heading of chronic rhinitis, and pass on to more debateable, but not therefore less interesting, ground. I refer to those obstructions which come under my second heading, namely, *mucous polypi* and *cysts*. I specify these as *mucous* simply to exclude malignant

neoplasms and fibrous polypi, though I do not intend allowing the term any narrower pathological significance.

Mucous polypi are usually divided into two classes, viz., those which from their structure more resemble adenomata, and those which may be classed as myxomata. In the former, histological examination reveals chiefly large mucous glands, which here and there may be expanded into cysts, lined with columnar epithelium and bedded in retiform connective tissue with more or less of the fibrous element; while, in the latter case, they consist chiefly of embryonic mucous tissue, pellucid jelly with nucleated corpuscles, some of which branch out to form a network, while their nuclei remain at the points from which the threads radiate. In both kinds there is a layer of ciliated columnar epithelium. Afferent and efferent vessels run through the pedicle or base, which is frequently, especially in old-standing cases, strengthened by the development of bands of white fibrous tissue dispersing in the substance of the neoplasm. There are no nerves, although Billroth claims to have detected them in some cases. But, as I shall show you presently, there is no real line of demarkation between these two kinds. We might as justly employ a more extended division according as granulation, mucous, spindle-celled, or fibrous tissue predominated. But we should only be the more persuaded that the distinction was artificial, seeing that every variety has the same cause as its primary factor.

usually classed as adenomata and myxomata

histology

all divisions artificial

A more practical division would be into those which contain cysts and those which do not. The cyst may attain a considerable size, but it has no limiting membrane, being merely lined with columnar epithelium. For the most part those polypi situated the furthest back are the most liable to contain cysts, and rarely a large polypus blocking the post-nasal region will collapse when grasped by the

cysts

forceps or noosed in the snare. Some cases of swelling of the posterior extremity of the inferior turbinated bone may belong to this class, as I have already suggested.

The mucous membrane in the neighbourhood of polypi, especially when these are of some years' duration, may be fairly or even quite healthy; an important fact which may mislead us if we attempt to investigate the etiology of these commonest of all morbid growths. Often, however, the most misleading facts are of the greatest value in ascertaining the truth—a philosophical parodox, which I hope you will pardon me for expressing.

physical character of polypi

Mucous polypi are pinkish, bluish, or sometimes greenish, semi-transparent bodies, which readily lose their water after removal, especially when cut, and become wrinkled and shrivel. They have a singular capacity for absorbing moisture even from a damp atmosphere, and hence the patient's pretty general complaint that his nose is more obstructed when the mercury falls. If after removing a polypus we immediately weigh it, and then immerse it in water for an hour or two, we shall find it has increased its weight by half as much again or more. This statement applies also to those portions of hypertrophied mucous membrane attached to the middle turbinated bone, which are so liable to degenerate into unmistakable polypi. I shall have to refer to this point again when discussing the etiology of these growths.

Capacity for absorbing water

But to proceed with the objective characteristics of polypi.

They pit under pressure of the probe, although the depression is quickly effaced. They are more or less movable, according to the latitude of their attachment. This is sometimes a distinct fibrous pedicle, sometimes no more than a slightly constricted base, and occasionally, chiefly in recent cases, they are merely sessile. Their

pedicle or base

usual site

usual seat in those patients who seek relief is undoubtedly the free border and under surface of the middle turbinated bone, although according to Zackerkandl's autopsies the superior meatus is the most frequent site. The growths occupy a varying space of the nasal fossæ, and may even be seen hanging into the pharynx, or protruding from the nostril. In the latter case their colour may be a darker red, a shade also developed sometimes after application of the galvano-cautery, or other destructive agent. In the case of those smaller polypi which grow from the superior meatus and descend between the middle turbinated and septum, which, moreover, may easily be pushed out of sight by the probe, forcible blowing of the nose will usually bring them again within the field of vision.

young polypi

When the polypi are young, and so small as to cause no subjective obstruction, we perceive on the under surface of the middle turbinated bone small reddish transparent smooth excrescences, which may readily escape notice; or if they are detected they may be considered merely as an hypertrophy of the mucous membrane. But they are not sensitive to the probe, and, moreover, if left alone, will develop into unequivocal polypi. Nevertheless in this early stage, as far as my observations go, they are invariably associated with a chronic inflammation and hyperplasia of the mucous membrane in their immediate neighbourhood.

Etiological pathology

And this brings me to the point where I must discuss the etiological pathology of the growths.

Chronic hyperplasia of mucous membrane may be transformed into polypus.

I believe that for the most part they may be regarded as œdematous inflammatory neoplasms. I have frequently watched a chronically inflamed mucous membrane slowly alter its appearance, becoming more congested and redder, then assuming a transparent œdematous aspect, gradually lose its colour and rapidly develop into a typical polypus.

And this in cases of both catarrhal and dry hypertrophic rhinitis, the resulting neoplasms being situated either on the free border or in the concavity of the middle turbinated bone. Indeed it appears to me that the variety of structure we find in mucous polypi depends largely upon the stage of the inflammatory process at which an œdematous change occurs. The œdema, moreover, is due in great measure or entirely to the fact that the inflammatory neoplasm is perpetually bathed in moisture, either from the contiguous mucous membrane, or from the hypertrophied mucous glands of its own structure. I will presently show you a section of hypertrophied mucous membrane, which after an hour's immersion in distilled water had increased its weight by one half. To all appearance it consists of mucous tissue, with large spaces and fine interlacing trabeculæ extending in all directions. The fibres are more inclined to be wavy than in the generality of polypi, and in this respect incline to the fibrous tissue of chronic inflammation. But in other parts of the same specimen this characteristic disappears.

œdema an important factor

see Plate I

Then, again, if we examine a portion of mucous membrane, the nature of which, as frequently happens, we are unable from microscopical appearances to assign definitely either to hypertrophy or polypus, we frequently find unmistakable evidence of both conditions. In some parts the tissue may be infiltrated with small round cells bedded in a fine reticulum like that of lymphoid tissue; in other situations we find spindle-cells of various sizes, their extremities lengthening into fibres, which intermingle with those of mucous spaces; while immediately beneath the epithelium we find the usual layers of hypertrophical connective tissue.

Sometimes it is impossible to say whether a structure is hypertrophied mucous membrane or a polypus.

In some cases polypi may be the result of metaplasia

(Virchow) occurring in the hyperplastic tissue, the products of chronic inflammation. In the neighbourhood of the periosteum we may find osseous metaplasia alongside of a similar mucous change. I have, under the microscope here, a section which represents this process as it takes place in a portion of hypertrophied mucous membrane detached from the free border of the middle turbinated bone, together with a few projecting osteophytes. In another portion of the same specimen one may see the bony spicule intruding between the lobules of a racemose gland, the fibrous tissue of which has undergone interstitial increase. This would fairly establish the fact that the osseous structure was a new formation, even apart from the small number of offshoots in the bone corpuscles, the numerical profusion of the latter, and other minute characteristics.

metaplasia—osseous as well as mucoid

see Plate I

So that it appears to me that we have conclusive evidence in favour of regarding nasal polypi as inflammatory products rather than belonging to the myxomata, or adenomata, or sarcomata. And, apart from the œdematous condition, which, as I have said, is largely due to the external conditions of the growth, the likeness between a young polypus projecting from a soft, friable mass of inflamed mucous membrane and the so-called fungous granulation is remarkable. That the latter contain a quantity of well-formed mucous tissue has been pointed out by Rindfleisch, although perhaps it is more correctly likened to lymphoid tissue. But it is an accepted fact that irritated connective and other tissues not uncommonly yield mucin, which thus becomes a product of inflammation (Virchow).

Nasal polypi to be regarded as products of inflammation

Therefore I do not mean to signify that all polypi are the result of metaplasia occurring in hypertrophied mucous membrane. When it springs from a friable inflammatory swelling which consists largely of cellular elements, its

The new growth may in some cases be likened to a fungous granulation.

growth is not unlike that of a fungous granulation. This is what I believe occurs: a small point becomes more inflamed than the surrounding tissue, rises above its level, and in consequence perhaps of its diminished support, in consequence, that is to say, of the dissolution of its fibrous elements, absorbs the moisture in which it is bathed, and becomes pale and œdematous. Its vessels increase in size; for, instead of breaking down on the surface as would an exposed granulation, the embryonic tissue grows and becomes feebly organized, thus increasing the demand for nutrition. The granulation elements branch out or become spindle shaped, developing around the base and the blood-vessels into fibres, exactly as happens in the process of healing by granulation. The inflammatory neoplasm advances, absorbing mucus externally, pushing the mucous membrane before it, or if not this, at any rate the ciliated epithelium, until it has become a structure wholly apart from, and independent of, its parentage. The surrounding membrane from which it sprung may, indeed, protected from external irritants by its swollen offspring, return to a healthy condition; but the polypus has its own pedicle and system of vessels, and there is nothing to stop its growth. Indeed it gains strength and independence by the conversion of its root into fibrous tissue from which bands ramify into its structure.

The microscope may assist prognosis

Polypi, as I say, tend to cicatrize at their base; but the cell-growth has, so to speak, got the start, and proceeds unchecked. Indeed microscopical examination will sometimes assist prognosis, for it is found that those polypi which consist for the most part of œdematous connective tissue are much less likely to recur than those which consist mainly of spindle-shaped elements, or mucous or granulation tissue (Billroth).

All mucous polypi contain a greater or less number of mucous glands, tubular for the most part, and greatly enlarged both in calibre and the size of their epithelial linings. The proportion they bear to the mucous tissue apparently varies according to the mode of preparing the specimens. If we harden them in alcohol the mucous spaces contract, the bulk of the growth diminishes, and the relative proportion of gland-tissue increases. So that, to form a just estimate, we must make sections without any hardening. These tubular glands can readily be accounted for on the hypothesis of hypertrophy and œdematous swelling. The lobules of the racemose glands become stretched and elongated from swelling of the tissue in which they are imbedded, and thus are converted into tubular glands. And this may also explain the apparent numerical increase. mucous glands

But whatever the amount of gland structure, the connective tissue of these polypi consists of granulation, mucous, spindle-celled, or œdematous fibrous tissue; and I do not see how any distinction is to be drawn between these and the myxomatous polypus.

I shall have to refer again to the etiology of neoplasms, the result of inflammatory processes when speaking of post-nasal vegetations. Perhaps it is not of much practical importance, except in the way of preventive surgery. But the history of nasal polypi is one of the most interesting problems in pathology, and they certainly form a connecting link between inflammation and neoplasms. Doubtless, all new growth, whether inflammatory or otherwise, is the result of irritation of pre-existing elements. And, at any rate in mucous polypi, inflammatory changes lead to the formation of tissue heterologous to that from which they primarily spring.

KING'S COLL

Treatment of nasal polypi

And now, gentlemen, after so much theory you will not be sorry if I give you some practical suggestions as to treatment. And do not imagine, because we see numbers of cases in the out-patient department of the general hospital treated more or less satisfactorily, and because every general practitioner is, to a certain extent, familiar with some methods of treatment, that the special hospital has nothing to teach you. On the contrary, while polypus-patients are frequently told they have an incurable malady, we come to regard them as among the most satisfactory and easy to cure. Yet the treatment has its difficulties, principally from the fact that the mere examination of the nose needs so much practice, more even than either the larynx or the ear.

satisfactory but difficult

In certain cases the growth of a polypus may be encouraged.

As a rule our primary object is to destroy nasal neoplasms wherever occurring. But there is one case in which we may congratulate ourselves on their appearance, and not only leave them alone, but even encourage their growth. When in a case of hypertrophic dry rhinitis a polypus appears above the level of the mucous membrane, we may expect it to have the most beneficial effect. For, as a foreign body, it stimulates secretion, and so relieves some of the most distressing of the patient's symptoms. Yet, in spite of our care, it may become dry and shrivel up. When necessary to destroy nasal polypi, as is almost invariably the case, we aim at two objects. First, the restoration of respiration through the nose, or the removal of more remote symptoms depending on the obstruction; and secondly, the prevention of recurrence. For the former our patient is immediately and profusely grateful, while the latter he will appreciate throughout his life, especially if he has formerly been assured, as is only too frequently the case, that his malady is incurable.

A two-fold aim, (i) destruction of the growth, (ii) the prevention of its recurrence

There are various antiquated methods of treatment seldom now adopted, such as injecting the growths with astringents, destroying them with chemical caustics, and so on. Of such I will not speak since I have no experience of their application. The systems to which I shall draw your attention are those of mechanical avulsion and that of the electric cautery. Among the former the forceps and the snare are the principal, and the only ones of which I shall speak.

Methods of avulsion

In discussing the use of the forceps, I shall treat separately of their application to large and small polyps. In the case of the former, their advantages and disadvantages are considerable. When the polypus is very large it is impossible to know precisely what we are including in the grasp of our instrument, and I have seen the whole of the middle turbinated bone inadvertently torn away, and that by experienced hands. On the contrary, it is in these very cases that the snare is so difficult of application. Yet so uncertain is the use of the forceps, that if we bring any bone away, we say, "so much the better," whereas if we do not we may justly pride ourselves on our skilful manipulation! Sometimes it may indubitably be desirable to remove the portion of bone from which the growth springs; but in that case we ought to see exactly what we are seizing, and not to do it hap-hazard. Then again, with large polypi the rapidity of work with the forceps may be of considerable importance. And I must tell you that some of the most practised and skilful hands prefer the forceps to any other instrument for ordinary cases. The hæmorrhage, however, is always more formidable with the forceps than the snare.

use of forceps

their uncertainty

For small polypi, the relations and extent of which one can easily discern, I think the forceps extremely serviceable.

advantages of forceps

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Wide-bladed and coarsely serrated instruments are generally the best, and the simplest mechanism is all that is necessary. Occasionally slenderer instruments like those known as *sinus*-forceps may be extremely useful, especially for polypi situated far back or above the middle turbinated bone. Whenever possible we should, as all the text-books on surgery inform us, twist the polyp round and round until it breaks away. Sometimes, however, the only feasible plan is to tear them forcibly from their attachments.

There is great variety in these instruments, some of which I will hand you for examination. Perhaps no improvement has been so good as Mackenzie's punch-forceps. The handle is fixed at the proper nasal angle on the slender blades, which contain a longitudinal punch and groove respectively. Those which lock, such as Beverly Robinson's, save us a little trouble, and Mackenzie's axial forceps are useful for polypi situated high up.

cold-wire snare generally preferable

Whenever possible, I prefer removing at any rate the great bulk of a polypus with the cold-wire snare, even if I finish it off with the forceps. If only for the small quantity of blood lost, the *écraseur* is far superior to the forceps. But it needs some dexterity, a good light, and a handy instrument; and, *cæteris paribus*, I consider the amount of blood lost to be in inverse ratio to the skill of the operator. There are almost as many snares as forceps; but the difference in utility is greater among the snares. The best for all practical purposes is Mackenzie's cog-wheel *écraseur*. We can wind up the wire, quickly or slowly, with the thumb, as we hold the instrument in the right hand, the left being free to alter the direction of speculum or the patient's head as required. Others, such as the many modifications of Hilton's, are available only with a soft noose, and are of no use in the denser varieties of polypus. But I find Mac-

the best instrument

kenzie's instrument equally good for all kinds, while it is the only possible instrument for those cases where we must hold the noose over the polypus with our finger in the pharynx. With this instrument, too, I have removed a polypus depending from the hinder part of the superior turbinated bone, and not visible from the front, by reflecting it in the rhinoscopic mirror. Indeed, of all instruments, I consider this the most essential for nasal surgery. Jarvis's snare and its many modifications have the disadvantage of requiring two hands for their use. It was originally devised for removing hypertrophied mucous membrane from the middle turbinated bone; but even for this Mackenzie's is far superior.

method of applying snare

Every polypus is more or less of an exceptional nature in the method of manipulation to be adopted. In the case of pedunculated polyps, our noose must be much larger necessarily than would grasp the pedicle. In tightening we must be careful not to pull upon the polyp, or we shall remove a much smaller portion than we had calculated for. Consequently, in every case, as we tighten the loop, we must advance the barrel of our instrument further into the nares. Also, as we tighten the snare, we should endeavour to lift it still higher on to the pedicle. For steadying the polypus as we do this we may grasp it, even before we throw the snare over it, with these very light forceps I have had constructed for the purpose, the forceps, of course, being thrust through the loop before seizing the tumour. In operating on growths situated very high up, or springing from the superior turbinated bone, we may find a small hook serviceable in holding the polyp in position.

the author's forceps: see Plate II.

Polypi which extend from the choanæ into the post-nasal space are sometimes too large to be included in any

Treatment of growths projecting into post-nasal space

snare which can be passed through the anterior nares. In such a case the best plan is to convey a noose of soft copper-wire twist into the pharynx by means of Bellocq's canula. We then thread the ends in the barrel of a suitable instrument, such as Wild's improved by Durham, hitch the noose over the growth with the left forefinger in the naso-pharynx, run the instrument into position in the nares, and instruct an assistant to fix the ends to the cross-bar. Then we tighten the noose and bring the polypus away. Such growths, however, are frequently more fibrous than mucous. In this case, the best plan is to operate in a similar manner with a snare of platinum wire rendered incandescent, while tightening, by the electric current.

Cocaine

It is scarcely necessary to state that cocaine should be applied freely before any operative procedure on the nose. A ten per cent. solution will generally suffice; but twenty per cent. gives more certain results, and with actually less expenditure of the drug. A fine nasal-spray producer is the most suitable method of application, as we can thrust the point behind and on all sides of the growth. Two or three minutes after applying the cocaine we may proceed to operate. In long-standing cases the mucous membrane has often become more or less anæsthetic.

after-treatment

As a rule, no treatment is called for after operation. Sometimes, however, after the removal of a large growth, an acute coryza supervenes in consequence of the unaccustomed exposure of the Schneiderian. Therefore in such cases, if the weather be inclement, I plug the nostril loosely with a pledget of cotton wool, which should be removed once for all when the patient reaches home.

Prevention of recurrence

For the prevention of recurrence there are two methods, both of which may be relied upon. The first is the galvano-cautery. If this is used so that the pedicle or base is

thoroughly destroyed, our object is gained; but if used timidly and not properly localized, we may be surprised at a continual recurrence. A precautionary word in the interests of over-sensitive patients may not be amiss. There is never any occasion to let the sufferer see the incandescent point, in itself sufficiently alarming. One is frequently told of this or that operator putting red-hot wires and irons up the nose; and of this the patient naturally dreads a repetition. But, the mucous membrane well anæsthetized with cocaine, and the burner not ignited until *in situ*, the patient need not know the precise nature of the caustic we may tell him must be applied.

galvano-cautery

It is generally advisable to apply the cautery immediately after removal of the growth by the snare, else, before the patient pays a second visit, recurrence may have taken place. But we must obtain a clear view of the structure to be destroyed; and all bleeding must have ceased before this is possible. Cold water is always a sufficient remedy, and we may wipe clean, with cotton wool wrapped round a probe, the region to be cauterized. One not inconsiderable advantage in using the galvano-cautery immediately is the diminished sensibility of the neighbouring mucous membrane, which, however, soon regains its normal condition after removal of the obstruction.

Several operations will generally be required before the polypus is completely eradicated. And even when we think all fear of recurrence is over, we should not speak too confidently. The safest plan, both for our patient and our own reputation, is to request him to visit us again at intervals of one to six months, according to the nature of the case.

Several operations generally required

The second method of preventing recurrence is the removal of that portion of the bone from which the polypus springs. This may easily be effected if the free margin of the

removal of bone to which pedicle is attached

bone be the site of the pedicle. Otherwise the galvano-cautery is less destructive of normal parts, and easier of application. For removing portions of bone, Mackenzie's punch-forceps, or nasal bone-forceps, may be used. Or for the anterior extremity we may employ Jarvis's or other form of *écraseur*.

When polypi are situated high up, springing from the upper surface of the middle turbinated bone, or from the superior spongy bone, it may not be possible to employ either of the methods I have advocated. But in such cases we may console ourselves by recollecting that few polypi recur more than three or four times after fairly thorough mechanical avulsion.

after-treatment

During the surgical treatment of nasal polypi it is preferable to suspend the use of all lotions or sprays, seeing that these but increase the tendency to rapid growth. Indeed we should aim at keeping the nasal cavities as dry as possible, and even forbid more blowing of the nose than is absolutely necessary. If much bleeding has occurred, we may keep the passages sweet with insufflations of iodoform, to which, if pain be present, a small quantity of morphia may be added.

Lecture 3.

GENTLEMEN,—In discussing post-nasal growths you will find me trespassing beyond the narrower limits of the subject even more than in those other forms of nasal obstruction to which I have drawn your attention in my previous lectures. For no form, not even that of mucous polypi, is further reaching in its effects, or has more symptoms for one or other of which our aid is sought; and at the same time for no variety of nasal obstruction is the treatment more simple in its means and satisfactory in its results, notwithstanding the fact that there is so much disagreement as to the most advisable methods to be adopted.

Post-nasal growths

The patient generally comes under the observation of the aural surgeon, since the affection usually escapes notice until some such serious symptom as deafness supervenes. Yet very frequently this causes no uneasiness to the child's parents; and more especially if the family medical attendant assures them, as is only too often the case, that he will grow out of it as he waxes older. The fact that children so easily contract a little Eustachian catarrh along with acute rhinitis, from which they speedily recover, is the only reason for supposing that deafness in children diminishes as they grow older; while it is perfectly certain that the subjects of post-nasal growths, although these may after many years disappear without any treatment whatever,

Patient generally applies to aural surgeon.

Children do not outgrow their deafness

nevertheless seldom outgrow the deafness which results from their presence, unless operative measures be adopted.

Ear symptoms:

To begin with, I will relate the subjective and objective signs of the ear-trouble. The child is deaf, and occa-

subjective

sionally (though generally it is in older subjects) he suffers from a humming, buzzing, or hissing tinnitus, seldom pulsating, unless there be some unusual complication. Often deafness is stoutly denied; but generally, on questioning the parents, they will admit that he has been very inattentive of late, and is frequently punished at

objective

school for no fault of his own. Moreover, if we examine the *membrana tympani* on each side, we shall be sure to satisfy ourselves of a necessarily faulty conduction of auditory vibrations through the drum. The most typical

depression of membrana tympani

appearance is a greater or less degree of depression of the drum-skin. The *manubrium mallei* is foreshortened and sometimes almost invisible. Posteriorly we may possibly get a view of the long process of the incus, and more rarely the *processus gracilis* is seen in the anterior segment. The surrounding membrane is variously affected, according to the duration of the post-nasal obstruction; it may not be thickened, and then sometimes appears more depressed than the *manubrium*, which stands out with an abnormal prominence. The membrane is not infrequently dull in lustre; the bright spot, which in a state of health radiates from the tip of the *manubrium* downwards and forwards, being more or less obscured, broken, or altered in situation. Beyond thickening and opacity, the drum-skin is sometimes congested, although seldom sufficiently to give rise to pain. The one distinctive feature, however, revealed by the ear-speculum is the extreme degree of depression. I say *distinctive*, seeing that if we find it in a child, by that alone we may be almost sure of the

presence of post-nasal growths ; and hence I have described the appearances somewhat minutely.

otorrhœa

Occasionally, though not very often, the child's chief trouble is otorrhœa, and we diagnose a chronic suppurative otitis with perforation of the membrane. And even in these cases, as we shall see, the post-nasal growths are still the most important factor, if we may judge by the results of treatment.

explanation of the membrane-depression

Why Eustachian obstruction should produce depression of the drum-skin may not at first sight be quite apparent. Most probably the explanation is to be found in the fact that the oxygen in the tympanum is converted into carbonic acid ; and when this latter undergoes solution in the mucus, we have one-fifth of the pressure removed, one in five being the proportion of oxygen in the ordinary atmosphere. But even if no oxidizing of carbon takes place, the greater solubility of oxygen over nitrogen would fully account for the diminished pressure. The latter, seeing that the Eustachian tubes are obstructed, necessarily causes depression of the yielding wall of the cavity, viz., the *membrana tympani*.

Snoring at night.

In order of the frequency with which patients complain of the different symptoms, next comes snoring at night. This is invariably present in greater or less degree, and the child may be never free from it during sleep. It depends, I need hardly add, upon the indrawn current of air inpinging upon the velum, the muscular tissue of which, if not enfeebled during the waking hours, as is frequently the case in the disease I am discussing, yet is physiologically relaxed, along with other voluntary muscles, during sleep.

other subjective symptoms

Then if we make further inquiry, we find the patient is restless, tosses about a great deal, and throws off the bedclothes, occasionally waking with mild delirium. Older

patients may complain of a dryness in the throat and mouth on waking, accompanied with a general feeling of malaise which diminishes as the day advances. The remaining direct symptoms are indistinctness of speech and inability to blow the nose satisfactorily. The disturbance in articulation is characteristic, but is similar to that found in the other forms of complete nasal obstruction. We are told that the patient speaks as though he always had a cold in his head. He unavoidably substitutes B for P, one of the important differences between these labials being that P is assisted by resonance in the nasal cavities. If with the post-nasal space completely occluded we try ever so energetically to say P, we can emit nothing more than an intensified B. Correspondingly D takes the place of T, and DH of TH. Similarly, seeing that M and N depend entirely upon nasal expiration, when this is impossible, we are forced to say *bay* for *may*, and *day* for *nay*.

peculiarities in articulation

labials and dentals

But besides these changes of labials and dentals dependent upon nasal obstruction, we may have other faults in articulation, due to inability of the palate to approximate itself to the posterior wall of the pharynx, either on account of the mechanical interference of the growths, or simply from paresis of the palate due to the co-existent congestion of the palatine glands and muscular tissue. The gutterals in these cases lose some of their value, and we find G substituted for K, and *kick* becomes *gick*. This weakness in the pronunciation of the gutterals is frequently found with a feebly-acting palate, where there is no obstruction, and the only other objective sign is a post-nasal catarrh, or vascular tumefaction of the inferior turbinate bodies; so that from a person's speech alone we may often diagnose a catarrhal condition.

gutterals

In extreme degrees of enfeebled palate the impairment of speech closely resembles that occurring in cleft-palate patients. Thus D may approximate to N, and B to M. Even G, hard, may be almost an impossibility; while S and CH are also difficult. But beyond such palpable deficiencies, there is more that cannot be easily described. The speech is thick, difficult of comprehension, nearly all consonants being more or less blunted, and nasal. In such cases the patient really speaks through his nose. Possibly enough the so-called Yankee twang is due to an enfeebled palate; and it is by no means unlikely that this is more frequent across the Atlantic, when we remember the prevalence there of post-nasal catarrh.

Speech may closely resemble that of cleft-palate patients.

Yankee twang

There are a few other and less important subjective signs. There may be accumulation of mucus at the back of the throat, a reflex cough from the irritation produced, or frequent hawking from the sensation of a foreign body in the throat which cannot be dislodged. Then there may be a watery discharge from the nostrils, and even a little excoriation may be produced.

cough

rhinorrhœa

Finally, there is always more or less general disturbance of nutrition. The child is anæmic. He is stupid to a degree greater than can be accounted for by the often very slight deafness. He is peevish, reluctant to play, and disinclined for exercise. He takes cold in his chest, as we are told, on the slightest provocation; he eats capriciously, and his bowels may be very irregular.

disturbances of nutrition

We now come to the objective signs, which, taken even separately and apart from special examination, are highly characteristic. To the physiognomical aspect of these patients I have referred in a former lecture. Let me recapitulate the points briefly. The buccal respiration attracts the attention of the most casual observer. It

Objective symptoms:

physiognomy. *see* Lecture I. p. 17.

does not consist merely in elevation of the upper lip as occurs in swelling of the middle turbinated tissue; but the lower jaw hangs away from the upper to a greater or less degree, while the lips are prominent and expressionless from enfeeblement, through partial abolition of function, of the *orbicularis oris*. Then when we have a good light thrown squarely on to the child's face we see a little depression on each ala of the nose, situated at the angle between the superior and inferior lateral cartilages. This apparently insignificant sign I consider quite pathognomonic either of the present or former existence of post-nasal growths. At any rate we do not see it in other cases of nasal obstruction. But besides this dimple, we observe with it that the nostrils are unusually narrow, while the bridge of the nose appears correspondingly widened. The collapse of the alæ and the dimples are due to the same cause. From inability to use the nose we must assume that the dilators of the nostrils are functionally in abeyance, and the alæ therefore collapsed; and this granted, we should assume that the portion least supported by the cartilages falls in the most. This portion is the angle between the superior and inferior lateral cartilages to which I have just referred, and which is filled in merely with a little connective tissue. Hence it collapses and forms a dimple.

Frequent association of enlarged tonsils with post-nasal growths

I have heard this depression and the slit-like nostrils referred to as a symptom of enlarged tonsils; but, as I shall presently point out, enlarged tonsils frequently accompany post-nasal growths: and although tonsils may be so swollen as to interfere seriously with buccal respiration, I hardly think they can encroach upon the post-nasal space any more than upon the Eustachian tubes as they were formerly supposed to do. So until I see a case of enlarged tonsils

without even the remains of post-nasal growths, I shall believe the signs I speak of to be pathognomonic of post-nasal obstruction. In confirmation of this hypothesis I may point out that even in double tonsillitis, where the tonsils may be more swollen than ever occurs from chronic enlargement, the patient almost invariably adopts nasal respiration.

Enlarged tonsils alone probably do not cause buccal respiration.

While still on the topic of the nose I must inform you that in a large number of patients suffering from post-nasal growths, the cavities of the nasal fossæ appear small and ill-developed; while in fewer cases the hard palate is highly arched and narrowed anteriorly. And this condition we may find in adults where little else remains to tell of the former obstruction; for, as I shall presently point out, these growths generally undergo more or less atrophy at puberty, just as is the case with enlarged tonsils; but only after much mischief, now irremediable, has resulted from their presence. This ill-development of the nasal cavities may be to a certain extent aggravated in consequence of their posterior obstruction and disuse, and is no more than one would expect on physiological grounds. The form of superior maxilla to which I refer is commonly described by dental surgeons as V-shaped. The contraction is sometimes excessively pronounced opposite the bicuspids; and the more pronounced it is, the higher is the vault and the greater the encroachment on the nasal cavities. Sir John Tomes says that this form of superior maxilla is frequently seen in children with enlarged tonsils, which, I repeat, frequently accompany post-nasal growths. He remarks, moreover, on the buccal respiration, but probably was not familiar with the vegetations. He attributes the narrowing of the superior maxilla to undue pressure of the buccinator on the alveoli consequent on the depressed lower jaw. But

nasal fossæ ill-developed

V-shaped superior maxilla

although the fact he notices is of extreme value, we need not accept his somewhat far fetched explanation of it. Of these points I shall have more to say when I discuss the etiology and pathology.*

pharyngeal appearances often distinctive

The next step in the examination of the patient is to inspect the pharynx. Here again the appearances are often quite distinctive. Very frequently, but by no means in the majority of subjects, we find the tonsils enlarged. Sometimes they are enormous, and meet in the middle line; and then we may defer the verification of our diagnosis until they have been treated by operation or otherwise. But it is especially when the tonsils are normal, or nearly so, that the pharyngeal appearances are so characteristic. The mucous membrane of the palate and posterior wall is often almost œdematous in appearance, although the colour is heightened rather than otherwise; that is to say, there is a semi-transparent and very watery aspect of the structures.

twisted uvula

This is seen especially well in the uvula, which may be rather elongated and twisted to one side—due, I imagine, to a commencing paresis of the muscular structure on the

paretic palate

opposite side. The palate, as I have already remarked in discussing the abnormalities of articulation, may be thoroughly paretic, refusing altogether to respond to tactile stimulation. But when we have the paretic palate, the œdematous *juicy* appearance of it, if I may so speak, is not so marked; and it is only in long-standing and generally anæmic cases that an extreme degree of muscular weakness is reached.

post-nasal catarrh

On the posterior wall of the pharynx we invariably see more or less mucus running down from the post-nasal region. Sometimes it is quite puriform, while at others it

* "A system of Dental Surgery," by Sir J. Tomes; 2nd edition. In the 3rd edition, 1887, the author's remarks are considerably curtailed.

consists solely of thick tenacious mucus. Occasionally we have to wash it away with a douche or brush before we can inspect the subjacent mucous membrane. This is always more or less granular. But the granulations share the general surrounding aspect. They look watery and œdematous, as compared with the granulations seen in common granular pharyngitis, and frequently appear paler than the membrane from which they spring. In this case they may attain a considerable size, increasing in the upper parts until they disappear behind the velum and become continuous with the masses of lymphoid tissue which crowd the post-nasal space. When the connection is so obvious as this, and the granulations of the pharynx are almost in direct continuity with the post-nasal growths, we can hardly have any doubt as to their pathological anatomy, and we are inevitably led to suspect that the granulations of granular pharyngitis are pathologically if not etiologically identical with post-nasal growths. Sometimes we find sessile or pendulous growths attached to the uvula. I have seen them over an inch and a half long—long enough, in fact, to pass into the œsophagus during deglutition, and thus fortunately to avoid the laryngeal cavity.

granulations on posterior wall

growths sometimes attached to uvula

Rarely one discovers a *pharyngitis sicca*, which in the absence of middle turbinated swelling or *rhinitis sicca*, is apt to confuse the diagnosis. But in such cases we find the growths confined to the upper part of the naso-pharynx, obstructing, in fact, the superior and middle *meati*. Respiration is not buccal, but is carried on through the inferior meatus solely, which, as I pointed out in my first lecture, is generally the cause of the mucus-desiccation.

pharyngitis sicca

see Lecture I. p. 15

We now pass on to ocular and digital examination of the neoplasms themselves.

In recent cases in young children it is impossible to use

Use of post-rhinal mirror

the post-rhinal mirror, partly because of the insubordination of the patient, but even more on account of the irritability and contractility of the soft palate. But in cases of long duration, where the velum is anæmic, pendulous, and not responding to tactile stimulation, we may complete our

image

diagnosis with the mirror. The image has a very varying appearance, but whatever the aspect of the individual growths, we see the post-nasal region more or less filled up. When the obstruction is not large, and especially when the surface is smooth and uniform, it may easily escape detection ; but, by directing attention to the outline of the summit of the choanæ, if we see this hidden, we may conclude on the presence of neoplasms. Frequently, however, we see the posterior wall, the vault, and the parts surrounding the Eustachian tubes, studded with excrescences varying in size from that of the conventional hemp-seed to the magnitude of a cob-nut or more. Occasionally they hang down in clusters, currant-like, from the vault and posterior wall. And in old-standing cases we may see a uniform mass rising from the posterior wall, overlapping the Eustachian tubes, and extending almost into the posterior nares and downwards so as to force the soft palate into a perpendicular situation. When the growth consists of individual lobules, we may see them readily through one of Zaufal's long nasal specula. But although this surgeon operates through his instrument, its employment is painful and quite unnecessary for diagnosis. The growths are generally pale in colour, smooth and moist on their surface. But the colour is sometimes as dark as that of the pharyngeal mucous membrane.

Digital examination

Whenever, for the reasons I have stated, the post-rhinal mirror cannot be employed, we may confirm our diagnosis with the finger thrust upwards behind the soft palate. This,

like all manipulations in the throat, must be at once bold and gentle, while we must irritate the pharyngeal wall as little as possible. Digital examination is not always as easy a matter as it appears, so closely may the velum be applied to the posterior wall. When there is any difficulty it can always be surmounted by putting the fore-finger, the palm of the hand looking necessarily upwards, behind the posterior pillar, a little above the tonsil, and sweeping it upwards. The finger then discovers a soft, yielding mass, seldom distinguishable as separate growths, but giving a very similar sensation to that afforded by a varicocele. The obstruction is never so great but that we can reach the septum, which, by the way, is rarely or never involved in the morbid process. We can also feel the orifices of the Eustachian tubes. It is the posterior wall and vault especially that are covered with the soft, yielding neoplasms. Sometimes the finger can detect no more than that the mucous membrane feels velvety and thickened; while in other cases, where, from other objective signs, we should expect to find a considerable mass of growths, we find only a few comparatively hard excrescences about the upper part of the posterior wall. This latter condition occurs for the most part in adults, in whom previously voluminous growths have undergone atrophy as puberty advanced. But taking all cases, the consistence of the neoplasms varies greatly. When we withdraw our finger we are certain to find it streaked with blood—a contingency seldom occurring when the post-nasal region is free of these vegetations.

Consistence of the neoplasms varies.

In every case of the disease we should not omit an examination of the larynx and thorax. In the former we generally discover more or less chronic congestion and even thickening of the mucous membrane, while in the thorax we

Examination of larynx and thorax

may discover various degrees of pigeon-breast, evidence of the obstruction to respiration.

Diagnosis

And now as to the *diagnosis*. There are very few affections for which post-nasal growths can be mistaken, and practically errors need never occur. The age of the patient

from fibrous naso-pharyngeal polypi

generally precludes the possibility of fibrous naso-pharyngeal polypi. The latter scarcely ever occur before puberty; while the same remark applies to mucous polypi occupying

from mucous polypi

the posterior parts of the choanæ. The fibrous polypus is hard and resistant, bleeding readily, purple or red in colour. There is frequent and severe epistaxis, distortion of neighbouring parts, &c., so that a mistake can hardly arise.

Anterior rhinoscopy will eliminate other sources of nasal

and from retro-pharyngeal abscess

obstruction. Retro-pharyngeal abscess, when occurring insidiously in infants, may be mistaken for post-nasal vegetations. But the dysphagia, the rigid neck, with retraction of the head, and the nocturnal elevation of temperature, accompanied by a fluctuating swelling in the back of the pharynx, ought to establish the diagnosis without much difficulty.

Duration

The *duration* of post-nasal growths cannot be definitely stated. Probably most cases advance or remain stationary until the fifteenth year or so, when, as is generally conceded, they atrophy, or lose their importance from the widening of the cavity in which they are placed. We must, however, never look forward to this atrophy as the *vis medicatrix naturæ*, since long before it occurs, much permanent mischief may result from their presence.

Etiology

The *etiology* of this affection is exceedingly obscure, and has given rise to much discussion. In the first place, as you will have already gathered, it is an affection almost confined to children, although very rarely we may find the growths developing in after life, and even after the fortieth year.

The two sexes appear to be equally affected. No special diathesis, as far as my observation goes, can be charged with their genesis ; although, seeing that many cases appear to result from chronic nasal catarrh, struma may indirectly have some influence. There are, however, certain associated conditions which throw some light on possible causes. I have mentioned the frequent co-existence of enlarged tonsils, and the badly-developed nasal cavities. And along with these, we sometimes find a narrow or typically V-shaped hard palate, with dental irregularities in the superior maxilla ; while, in a large proportion of all cases of cleft-palate, we find the post-nasal region more or less crowded with vegetations.

no special diathesis

So that we cannot, I think, infer that inflammatory action is always the cause of post-nasal growths. But before I can discuss further their etiology, I must make you acquainted with their pathological anatomy.

inflammation not the only cause

Speaking concisely, we say that the post-nasal growths consist of lymphoid tissue, and are nearly identical in structure with the tonsils. This lymphoid tissue is frequently called adenoid, after the nomenclature of His ; but seeing that we have no authority whatever for assuming the tonsils or other accumulations of this tissue to have a glandular structure or function, the term is somewhat inappropriate. But anyhow, if we do prefer to speak of *adenoid* post-nasal growths, we must remember they are in no sense glands. This tissue, I need scarcely remind you, consists of a retiform connective tissue, the trabeculæ of which are formed of ramified corpuscles, which may or may not retain their nuclei. The network is more or less stuffed with lymph corpuscles. Remembering that physiologists are unable to assign any definite function to this tissue, and that we find it, one may almost say, scattered

Lymphoid or adenoid tissue;

its wide distribution

everywhere; forming the sustentacular tissue of the blood-vessels and the network within the lymphatic glands; composing the solitary and agminated glands of the intestine, the tongue and the tonsils; constituting the thymus gland and the spleen; situated in the intestinal mucous membrane, and forming a distinct layer in the mucous membrane of the pharynx and naso-pharynx, in which situations it is gathered up here and there into distinct structures, especially in the region known as Luschka's tonsil, and in a band running round the posterior wall on a level with the margin of the superior constrictor; remembering, I say, the evident importance of the tissue, although we cannot discover what purpose it fulfils in physiology, we cannot but be in doubt as to its significance when it appears as a pathological product. Is it inflammatory in its origin? Is it strictly a neoplasm? Or is it still physiological? Such and similar questions naturally suggest themselves, and would be of considerable importance in the treatment of the sufferers if we could answer them truly. Are we, for instance, to operate whenever we discover post-nasal growths, independently of any interference or not which they may cause?

and obscurity of function

Although I do not pretend to answer physiological questions, I shall nevertheless venture to suggest an explanation of the special forms of lymphoid growths which we are discussing.

Theory of post-nasal growths

I must, however, diverge for one moment to show you how I regard the tonsillar structure and its hypertrophy, in order to warn you of what I cannot but consider a real danger. There is a strong tendency to regard the tonsils as physiologically unimportant. This view is partly maintained, I imagine, by the unfortunate facility with which the structures can be amputated, and our consequent self-

Small importance of tonsils?

gratulation on having done something. But when we remember the enormously rich blood supply of these organs, I think we must allow them an important part in the economy, although we may not have the least idea as to its nature. Blood cannot flow through any structure without either causing growth of that organ or being used by it for some work—unless, indeed, the tonsillar veins, &c., contain arterial blood—a supposition too ridiculous! And since the tonsils remain stationary in size, we know from physiological laws that they must perform considerable work. Therefore do not let us remove them unless their hypertrophy is causing real mischief and cannot be subdued by medicinal measures.

And since it is more than highly probable that the lymphoid tissue of the tonsils performs definite work, so must we assume the same tissue elsewhere to possess its functions. Nor shall we be going too far in assuming that the collections of lymphoid tissue known as Luschka's tonsil, and others scattered over the naso-pharyngeal surface, are physiological.

Hypernutrition in lymphoid tissue

But, as I just now casually remarked, if nutriment to the tissues is put to no other uses, it will augment the bulk of those tissues. In many organs of the body a special structure is provided for the absorption of superfluous nutriment, in what is known as adipose tissue. Only second to this, as it appears to me, in capacity for assimilating nutriment is the lymphoid tissue. Indeed the condition commonly described as hypertrophic pharyngitis, where the velum, the uvula, and the pharyngeal walls are uniformly thickened, is simply an hypertrophy of the lymphoid tissue existing in the deeper layers of the mucous membrane, and occurs almost invariably, as far as my observations have gone, in plethoric or overfed individuals.

In my own mind it is quite certain that just as fat is deposited in the subcutaneous tissue, so does this lymphoid structure hypertrophy in the sub-mucous tissue, at any rate in the case of adults.

But these remarks obviously do not apply to special collections of the tissue, such as the tonsils and those on the posterior naso-pharyngeal wall. Enlargement of these does not accompany systemic hypernutrition. Before puberty, however, these collections of lymphoid tissue apparently have a great tendency to hypertrophy under slight or imperceptible stimulation. The irritation leading to increased blood supply may be only local, as in enlarged tonsils and post-nasal growths. In subacute, running into chronic tonsillitis, where there can be no doubt as to the inflammatory condition of the mucous membrane, we may get permanent increase of the lymphoid tissue, and enlargement of the organ. And I imagine that it is either to some similar conditions that we must look for an explanation of the presence of post-nasal growths, or else to some other cause of local repletion.

In children strong tendency of lymphoid tissue to hypernutrition

In the first case, it is highly probable that a chronic inflammatory condition of the nasal mucous membrane is the cause of the hypernutrition in the lymphoid tissue of Luschka's tonsil and that of the posterior wall. Thus it is especially in cold damp climates that these growths have been detected. In Denmark—Meyer of Copenhagen being the first to draw due attention to their importance—they appear to be very common. In the north of Germany, in Great Britain, and in France they must be nearly as prevalent. And it is just in such climates that acute and chronic rhinitis is most common in children. In America, where the atmosphere is peculiarly dry, the post-nasal growths are much less common; and here, although in

post-nasal growths common in damp climates

adults post-nasal catarrh is almost the rule, there is less liability to take cold from simple exposure to the weather. As with ordinary catarrhs, so post-nasal growths run in families; but I have seen no evidence of hereditary influence as is claimed by Meyer and Löwemberg. Nevertheless, dental surgeons acknowledge distinct heredity in the matter of the V-shaped superior maxilla; and from the frequent association of this with post-nasal growths, we may so far assume the influence of heredity in the latter. So that, considering these various facts, I think we may safely infer that nasal catarrh is an important element in the production of post-nasal growths. But many of such cases, I suspect, are assisted by other means through which local hypernutrition is established. To these I will now refer.

heredity

The frequency with which the post-nasal region is found crowded with lymphoid growths in cases of congenital cleft-palate, points to some other cause than nasal and post-nasal catarrh. It has been supposed that the food passes into the post-nasal region during deglutition, and so sets up a chronic inflammatory condition. But as a matter of fact, this is very rarely a source of complaint in cleft-palate patients. Owing to the sphincter-like contraction of the superior constrictor, referred to by Billroth, and often observed by myself both in these patients and by means of anterior rhinoscopy in ordinary cases, the posterior wall of the pharynx comes almost into apposition with the margin of the hard-palate, while the tonsils by the same agency are approximated; and it is by these means that the deficiency is effectually closed. So the theory of direct irritation is insufficient. According to Dr. N. W. Kingsley, of New York, the principal living authority on the subject of oral deformities, congenital cleft-palate is usually accompanied by more or less deformity of the sides of the alveolar

the concurrence of cleft-palate

and of this with contracted nasal fossæ

arch.* Sometimes they are abnormally far apart; but more frequently they are found pinched together. This must correspond, as in cases of the V-shaped superior maxilla, with contracted nasal fossæ; and thus far the condition is similar. And it appears to me probable that for all cases where this contraction obtains, we have a very simple explanation of post-nasal growths. But to make this causation plain, you must pardon me if I refer once more to the physiology of the nose. The principal function of this organ appears to be warming of the inspired air; that is to say, the tissues are constantly giving up heat. Now we know that the generation of caloric implies work-potential as much as the secretion of bile, mind-energy, or any other physiological phenomenon. That is to say, oxygenation of tissue must be carried on at a peculiarly high rate in the nose and post-nasal region.† Now, if the post-nasal space is deprived of the cold air necessary to the performance of its functions, whether from congenital malformation as in cleft-palate, or from nasal obstruction caused by narrowing of the nasal fossæ in combination with chronic rhinitis; if also the tissues are themselves in a state of inflammation, and so their duties seriously interfered with; we must assume that the rich blood supply will be converted to other uses, and over-nourish that lymphoid tissue which in young people, and wherever situated, is so ready to assimilate property to which it is not strictly entitled.

Interference with the generation of caloric leads to hyper-nutrition.

The post-nasal region probably plays important *rôle* in warming the inspired air.

That the post-nasal region has an important share in calorification, we may presume from the fact that, owing to the direction of the epiglottis backwards during ordinary

* "A Treatise on Oral Deformities," &c., English ed., 1881.

† According to Aschenbrandt's experiments, by the nasal cavities alone the inspired air is raised to the temperature of the body. ("Ueber die Bedeutung der nase im Respiration," Würzburg, 1886.)

respiration, the inspired air is swept over the posterior wall. I may suggest, by the way, that this position of the valve has something to do with the difficulty attending buccal respiration.

Moreover, in cases of cleft-palate, apart from the usual accompanying contraction of the nasal cavities, the inspired air must enter the buccal cavity before it reaches the posterior naso-pharyngeal wall. Consequently the latter is prevented, partly for this reason, from performing its functions.

I hope, gentlemen, you will not think I am drawing conclusions from insufficient premisses. I do not think, myself, I am trespassing beyond the rules of scientific deduction. We have certain facts known concerning a given phenomenon; our reason tells us that there must be one or more causes both for the phenomenon and its various attributes; and by questioning how the individual points may be produced, we should arrive at the real nature of the phenomenon. In the present case we are given the facts of persistent nasal obstruction, either from congenital malformation, or from chronic rhinitis, or both. We are also given the fact that the tissue of which post-nasal neoplasms consists is everywhere prone to over assimilation; and we are given the fact that interruption in the performance of work must lead to hypernutrition. These are our data: and we can hardly be considered unscientific in considering them related to one another in the manner I have indicated.

recapitulation of data for theory advanced

The treatment of post-nasal growths need not detain us long. In the first place you should not remove them simply because your finger may detect a few; and unless there is marked buccal respiration with its accompaniments, they may be left alone and allowed the honour of physiological

Treatment

respect. But this rule has one reservation. If the hearing is affected—and for this we must not take the word of even enlightened parents, but rest solely on the aural speculum—if the hearing is faulty, I say, and we can detect any post-nasal growths, we should always remove them, even if they are causing no Eustachian obstruction.

Even where we have a perforation of the *membrana tympani* with a suppurative otitis, we may expect the most remarkable results from removal of the growths—even though they are too few to produce any direct symptoms. Such cases, together with a fact I have repeatedly observed, viz., that the improvement in hearing is less marked when we remove the growths by several operations, than when a complete clearance is made at one sitting, make me believe that the advantages of the operation are largely due to a counter-irritant action. Another argument in favour of a single operation is the recurrence of the growths if they are not completely eradicated. I have seen several instances of this; and although the view is not generally held, Meyer has remarked on the fact.

Removal at one sitting under chloroform advocated

The instrument I always employ is a modification of Löwemberg's forceps. The precision, rapidity, and accuracy with which these can be used, has made me reluctant to employ other instruments. The cutting-edge should be confined to the posterior and upper surfaces of the spoon-shaped extremities, else there is some danger, especially when no anæsthetic is used and the finger cannot guide the instrument, of gripping the mucous membrane on the posterior surface of the soft-palate. Whenever possible, chloroform should be administered, and this in preference to ether, as the latter produces congestion of the mucous membrane, and so increases the hæmorrhage. The shoulders should be slightly raised with the head inclining backwards,

position of patient

in order that the blood may flow from the nostrils rather than into the pharynx. Then, with the forefinger of the left hand as a guide in the post-nasal space, we thrust the forceps behind the velum, and remove the growth piece by piece. When at all resistant, they should be twisted as much as possible before being torn off. Working in this manner we can rapidly remove every particle, and run no risk of doing mischief. In order to emphasize the sort of trouble that may arise from careless operating, let me tell you that, in one of my earliest operations, I removed inadvertently a splinter from the vomer; and in another case where I allowed a clinical clerk to operate, I found to my dismay that he had stripped the whole of the posterior wall of mucous membrane! But by feeling every portion with the finger before removing it, we obviate all such dangers. When operating at several sittings without an anæsthetic, we cannot use the finger in this manner, and must trust to our sense of touch transferred to the cutting-edge of our forceps, while making, at frequent intervals, digital examinations.

accidents

operation without anæsthetic

hæmorrhage

The hæmorrhage is sometimes rather profuse, but seldom sufficiently so to necessitate the exhibition of styptics. I have never heard or read of a case of alarming hæmorrhage.

after-treatment

The after-treatment is of some little importance. The temperature usually rises slightly for a day or two, and sore throat is complained of. But forty-eight hours in bed, with slop food, are all that is required in the way of treatment. From that time the patient's health begins to improve rapidly in every way. His hearing distance, is in nine cases out of ten, immediately increased, and often to an extraordinary degree. The snoring also disappears, but the buccal respiration and the faulty articulation take longer to overcome. The patient needs careful education in speech

Education in speech and respiration necessary

and respiration if he is to surmount the long-enforced evil habits. And we must remember that chronic catarrh with hypertrophy of the mucous membrane, deflected septum, and general narrowing of the nasal fossæ, not only are often the causes of the post-nasal growths, but in themselves may be sufficient to produce buccal respiration. Therefore these points demand as much attention as the main trouble.

Inspection of drum-skin is advisable, as suppurative otitis may occur.

But there is one point upon which I must lay great stress, namely, the careful inspection of the *membrana tympani* for three or four days after the operation. Rarely, and even while the hearing is notably improved by the operation, we may find subsequently a slight suppurative otitis. Perhaps no pain is complained of in the ear, and the only indication of the mischief is a small perforation of the drum-skin. In the very few cases I have seen of this accident, no harm has resulted. The perforation readily healed, almost as though it were traumatic, and left no trace of its existence. I do not think that any blame is to be attributed the operator when this occurs and I do not consider it in any sense an argument in disparagement of the operation. Why it should occur I do not know; it may possibly belong to the little understood domain of counter-irritation. It is more probable, however, that the first opening of the Eustachian tube admits blood as well as air. This putrefying would indubitably excite a suppurative otitis. Not a few cases are on record where epistaxis has been followed by otitis, probably due to similar causes. I have seen one such myself, and can recall a very severe case of otitis following the removal of a polypus, springing from the middle turbinated bone.

Other methods of operating

Various other methods are employed for the eradication of these growths, from the finger-nail to the cold-snare

applied through Zaufal's funnel. But to my mind nothing is so precise, speedy, and I may say miraculously beneficial, as the forceps. How a curette can avoid injuring the the mucous membrane along with the neoplasms, I cannot see; nor can I believe in the removal of such dense structures, as one sometimes finds, with the finger-nail. But it is only fair to tell you that one of the most celebrated aurists in London affirms that if he finds post-nasal growths on digital examination, he removes, then and there, without introducing his finger a second time, as many of the vegetations as he considers necessary—which I venture to think is not many. For my own part, whenever I have attempted removal by the finger-nail, which I must confess has not been often, I have found the improvement in hearing but slight, while sometimes a rapid recurrence of the growths has taken place.

I think it is generally advantageous to apply, a few days after the operation, some form of astringent to the post-nasal region. We may use a diluted glycerine of tannin, or a solution of perchloride of iron, applying it with a camel's-hair brush behind the soft-palate on alternate days, or even daily, as soon as all pain on swallowing has passed away. And besides this, it will generally be necessary to keep the passages of the nose and vault of the naso-pharynx clean with antiseptic sprays, such as the *lotio alkalina*, to which I have referred so often.

Treatment of the paretic palate

The paretic palate is as difficult to treat as the buccal respiration; but, at any rate in young and intelligent persons, we can hope for much improvement in the speech. Education in elocution gives the best results, seeing that the faulty habits in word-production must be eradicated. I always recommend my patients to accustom themselves to gargling with cold water on every opportunity, and, if

gargling

they sing, to use head and falsetto notes as much as possible. By these means the levators of the palate and the superior constrictor are thrown into action. In long-standing cases I have had good results from applying faradism to the muscles at fault. But the process is tedious, and few possess the necessary patience for its satisfactory employment.

faradism

NOTES.

A.

ON "NECROSING ETHMOIDITIS"

A word on this hypothetical affection may help to clear up an erroneous impression. In a large proportion of nose-patients, those initiated into the mysteries of discovering diseased bone may be misled. For if we pass a probe gently into the concavity of the middle turbinated bone, it may impinge on what every skilled hand would indubitably pronounce to be necrosed bone. But we have no suppuration, no fetor, and the symptom remains unaltered through many years; hence the probe misleads us, and we must trust to common sense in making a diagnosis. We are driven to suppose that the mucous membrane and periosteum are so attenuated in this situation that they scarcely interfere with the impact of the probe on the bone. I may remark that an ivory exostosis of the external meatus of the ear may give a very similar impression to the probe.

B.

ON ATROPHIC RHINITIS

Although in the text only that form of atrophic rhinitis is referred to which results from inflammatory absorption of the bone tissue, one must not forget a commoner form in which no hypertrophy precedes the atrophy. It affects chiefly the inferior turbinated tissue, and occurs for the most part in anæmic constitutions. The spongy bone actually bears so small a proportion to its erectile tissue, that the observer is too ready to imagine the bone itself is atrophied when only its coverings are affected; and it is presumably in such cases that we hear of the bone tissue being regenerated (Moure).

FORMULÆ.

Nebula Alkalina :

℞	Sodæ bicarbonatis . .	gr. xv
	Boracis	gr. xv
	Acidi Carbolici . . .	gr. iv
	Glycerini	m. xlv
	Aquæ fontis ad . . .	℥i

Used as a nasal spray or for insufflation diluted with two parts of warm water.

℞	Tincturæ Sanguinariæ Canadensis	℥i ad ℥ii
	Aquæ ad	℥i

As a stimulating nasal spray.

Insufflations :

℞	Pulv. Gummi rubri . . .	p. i
	Pulv. Amyli	ps. ii

For use as a nasal stimulant and antiseptic.

	Iodoform . . . }	
	Pulv. Amyli . . }	partes æquales

As a powerful antiseptic in ozœna. Iodol may be substituted when the smell of iodoform is badly tolerated.

Plate I.

Fig. 1.—Section through hypertrophied mucous membrane, depending from middle turbinated bone. (*a*) osteophyte; (*b*) normal bone; (*c*) venous space; (*d*) blood clot.

Fig. 2.—Ditto. (*a*) blood clot in venous space; (*b*) Haversian canal; (*c*) giant cell and osteoblasts; (*d*) mucous tissue.

Fig. 3.—Ordinary mucous tissue from nasal polypus.

Fig. 4.—Œdematous fibrous tissue, obtained by immersing hypertrophied mucous membrane in water.

Fig. 5.—Œdematous connective tissue from elongated uvula.

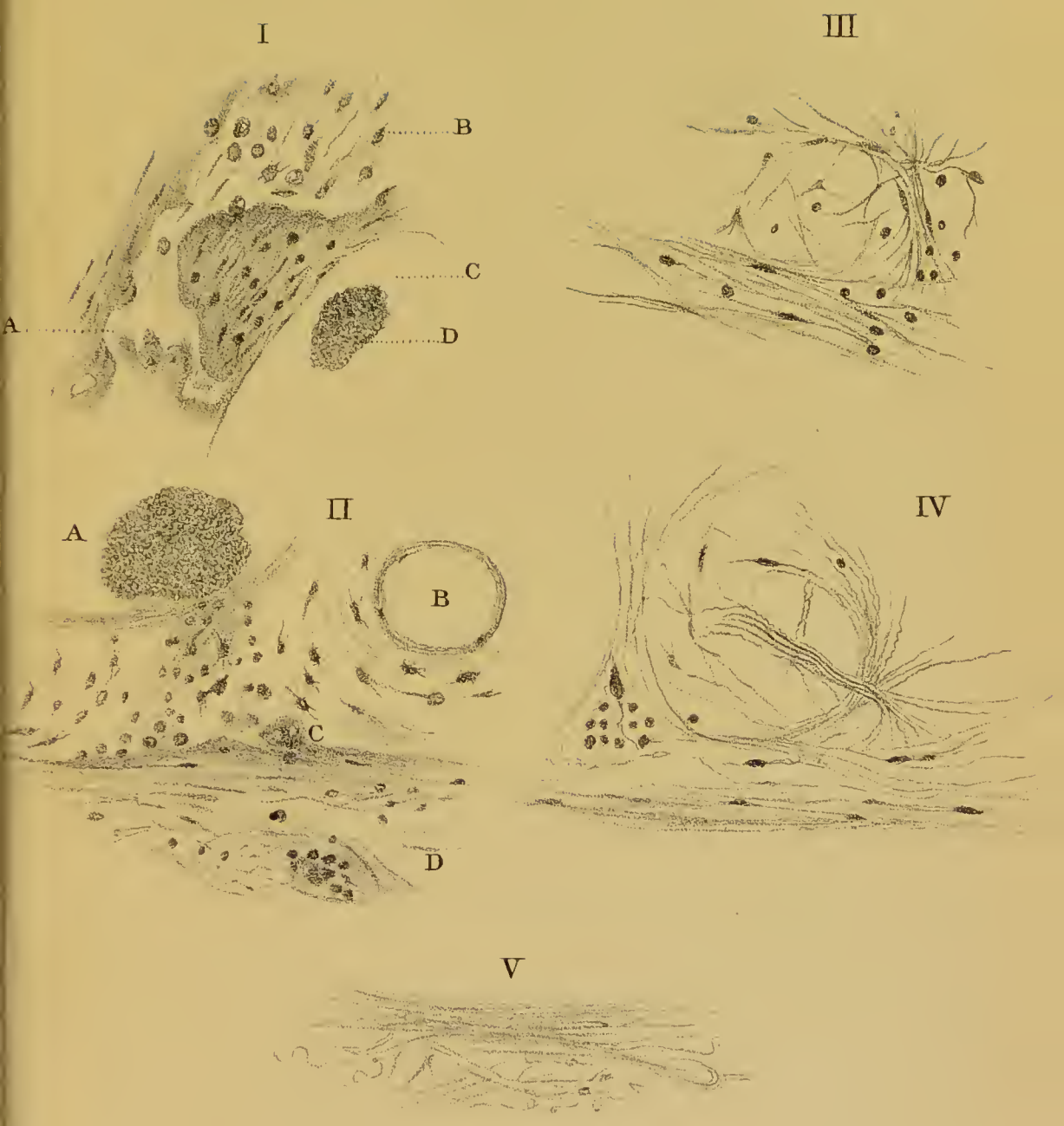

I
B
C
A
D
III
II
A
B
C
D
IV
V

Plate II.

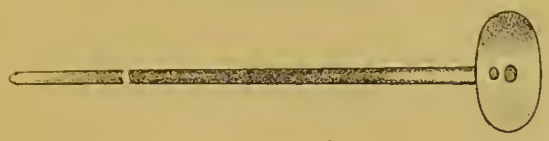
Fig. 1.—The Author's nasal speculum, with springs for holding the shields, Figs. 2 & 3.

Fig. 4.—The Author's forceps for seizing polypi in conjunction with the snare. The long diameter of the rings is transverse, in order to give the instrument a firmer grasp when held in the first and second fingers.

The instruments are made by Messrs. Mayer & Meltzer.

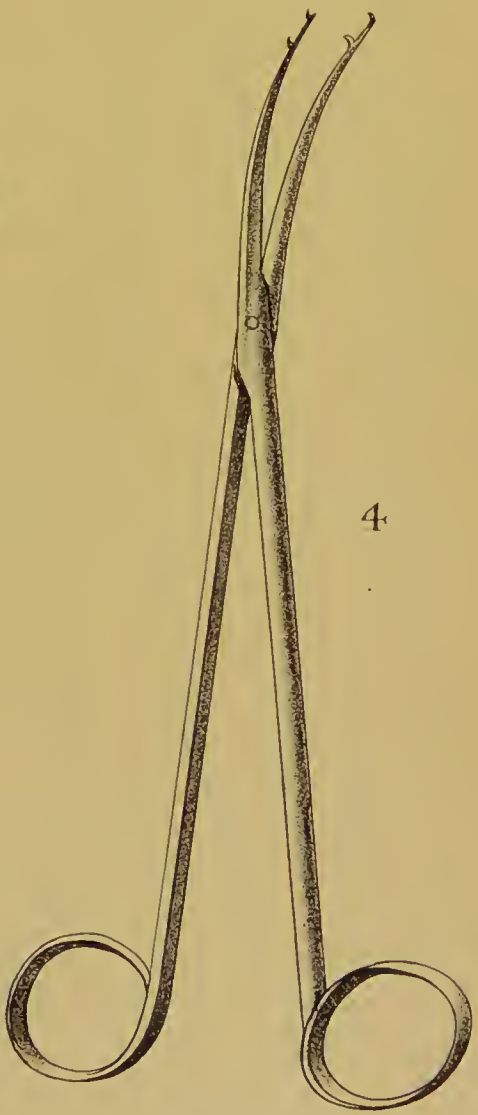


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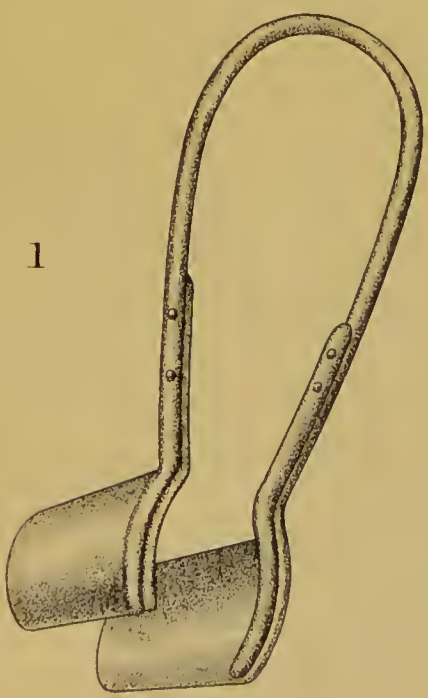
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